GOVERNMENT OF KERALA

Kerala Development Report

ACHIEVEMENTS PERSPECTIVES

KERALA STATE PLANNING BOARD
MARCH 2026

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Foreword

The "Kerala Development Report 2026: Achievements and Perspectives" documents the development initiatives and achievements of the Government and people of Kerala from 2016 to the present, evaluates these achievements, and proposes guidelines for the future development of the State. Over this decade, Kerala has sought to create and to present to India and the world a democratic, socially inclusive, participatory, high-growth, and sustainable alternative development policy.

In the decade from 2016 to 2026, every sector of the economy has been put on a new path of development and growth. The human development sectors, including education – school and higher education, skilling and professional education – and health – primary health facilities, and the development of public health and of public hospitals – have been transformed. Human development gains have been used as a springboard for economic growth, and change in the primary sectors, and in industry, infrastructure, and the modern services (including information technology and tourism) has been unprecedented.

Decentralised planning and governance continue to be of central importance, with a steady increase in the devolution of funds and a widening and deepening of the development activity undertaken by local governments. The share of budgetary funds designated exclusively for people of the Scheduled Castes and Tribes has consistently exceeded the share of the people of Scheduled Castes and Tribes in the State. State support to the elderly and to persons with disabilities has been areas of high priority in the planning process (indeed, the Gender Budget and now the Elders' Budget are important parts of the Annual Budgets). The policy on housing for the poor – and the actual modern, safe, comfortable houses built for the poor – has set, as in other fields, new national standards. State funding of cultural festivals and public expenditure on artists and public access to new cultural facilities have increased substantially. Medium and large-scale infrastructure has been financed through the innovative instrument of KIIFB.

In November 2025, the Government of Kerala fulfilled a historic promise to the people when it put an end to absolute poverty in the State.

These achievements are reflected in Kerala's performance in national-level indices, such as the Sustainable Development Goals India Index, National Multidimensional Poverty Index, and sectoral indices and rankings in education, health, and industry, to name a few.

This progress has been despite the obstacles the State Government faces. The centralisation of taxation under the Goods and Services Tax, the withdrawal of assured GST compensation despite the continuation of the compensation cess, restrictive borrowing limits, a growing reliance on conditional and discretionary transfers, the erosion of State share in the Union pool with expanded cesses and surcharges outside the divisible pool, the supplanting of unconditional Finance Commission transfers by Centrally Sponsored Schemes characterised by rigid design, delays, and partial releases, institutional and operational constraints for States within the GST framework, have all weakened the principles of cooperative federalism, reduced fiscal predictability, and narrowed the policy space available to States such as Kerala to sustain public investment alongside their social and developmental commitments.

Among the early decisions of the LDF Government in Kerala when taking office in 2016 was that, although the Government of India had abolished the Planning Commission and the Five-Year Plan process, the State Government would continue with Five-Year and Annual Plans to guide Kerala's economic development. This was a bold and independent decision; Kerala remains the only State in India to have publicly committed to continuing the planning process. For the Government of Kerala,

the formulation of public policy is an exercise in people's participation, and involves the widest possible consultations with experts and all sections of the people before it is finalised. In this Report, we present some of the policy initiatives, programmes, and schemes introduced by the Government as envisaged in the 13th and 14th Five-Year Plans and the salient achievements in some sectors of the economy. The Report also describes the challenges that we face and the way ahead. A more comprehensive account of this Government's visions, plans, schemes and programmes, and performance are available in the Approach Papers to the 13th and 14th Five-Year Plans, the Kerala Development Report of 2021, Annual Plans from 2016-17 to 2025-26, the Economic Reviews from 2017 to 2025, and other documents of the State Planning Board. These are available at https://spb.kerala.gov.in.

My colleagues in the Kerala State Planning Board and I hope that this Report serves as a document of reference with respect to the initiatives and achievements of the Government of Kerala, and as a guide when charting the future development of the State.

V K Ramachandran
Vice Chairperson
Kerala State Planning Board

Chapter 1
Introduction

It is a truism that the development process in Kerala has been distinct from that of other States, and that its experience has lessons that go far beyond India. The distinction is this: the locomotive of Kerala's achievements has not been the market, but has been public action, driven by progressive Governments, and by the direct interventions and participation of the people. Social change in Kerala has been built on the foundations of the movement for social justice, and of land reform. It is built on early investments in the people, particularly in the fields of education and health. It was enriched further by participatory local government. Throughout this period, the involvement of the people was vital to social change and development. Today, 70 years after the formation of the State of Kerala, the Government of Kerala has been able to implement a decade-long policy of using the human development gains of the people as a springboard for economic growth and modernisation. It has been able to do so because of its commitment to serving the people, and to leaving no human being behind in the development process.

Economic Planning

Kerala remains the only State in India to have publicly committed to continuing the planning process. In Kerala, the process of formulating Five-Year Plans is an exercise in people's participation. The Kerala State Planning Board has been responsible for drafting these Plans since 1967. The Planning Board conducts the widest possible consultations, and forms Working Groups to cover every sector of the economy. These Working Groups, whose members include scholars, administrators, social and political activists, and other experts, draft reports which serve as the foundation for the Five-Year Plan. For the 13th Five-Year Plan, 43 Working Groups were formed, with a total of more than 700 members. In 2021, for the 14th Five-Year Plan, 44 Working Groups were formed, with a total of about 1,200 members.

The Five-Year Plan serves as a guiding framework from which departments develop specific policies and programmes. Annual Plans are formulated each year, in alignment with the Five-Year Plan, through a process involving Government departments and elected representatives. Ministers and officials of the Government actively engage with the public, traveling to Districts and local governments, organising adalats, and facilitating platforms such as the Nava Kerala forums. These interactions allow them to understand people's needs and priorities, which are then reflected in the schemes proposed for inclusion in the Plan.

The 14th Five-Year Plan built on the achievements of the 13th Five-Year Plan with the following objectives.

a. to build on strengths in social investment (health, school education, and housing), social welfare, and social and gender justice;
b. to use the strengths of the State in human development to build a knowledge society and accelerate growth of the productive forces in the economy;
c. to apply science, technology and modern skills to enhance growth in agriculture, allied activities, modern industry, infrastructure development, and income-bearing services, including information technology, tourism, and retail trade;
d. to build a modern, high-employment, productive economy;
e. to modernise and enhance the system of higher education and provide Kerala's youth with the best forms of skilled employment available in a modern economy;
f. to end extreme poverty in Kerala;
g. to establish comprehensive and innovative systems of waste management;
h. to help local governments become engines of growth; and
i. to promote an inclusive development process – the guiding principle of the development process is to leave no person behind.

Economic Growth

Kerala's growth rates are comparable to, and in some years higher than, the national average, despite the economic shocks caused by the Covid-19 pandemic, natural disasters, and restrictive policies of the Union Government. At constant prices, GSDP in 2024-25 was 22.5 per cent higher than in the pre-pandemic level of 2019–20, with an average growth rate of 4.1 per cent over the five-year period- a significant achievement considering the negative growth in the pandemic year. Public policy in Kerala has stimulated demand, controlled inflation, and protected livelihoods.

This period also saw an increase in the service sector share in Gross State Value Added (GSVA) from about 61.6 per cent in 2015-16 to 63.4 per cent in 2024-25,

Table 1.1 *Plan outlay and expenditure, Kerala, 2016-17 to 2025-26* in Rs crore

Year	Plan outlay	Plan expenditure	Plan expenditure as per cent of Plan outlay
2016-17	24,000	24,470.7	102
2017-18	26,500	29,896.8	112.8
2018-19	29,150	26,047.3	89.4
2019-20	30,610	24,445.2	79.9
2020-21	27,610	36,214.2	131.2
2021-22	27,610	39,281.9	142.3
2022-23	30,370	37,241.5	122.6
2023-24	30,370	38,714.9	127.5
2024-25	30,370	41,287.7	135.9
2025-26	32,500	24,380.2*	75
2026-27	35,750	-	-

Source: Annual Plans
Note: *Expenditure for 2025-26 from Plan Space, up till February 2026

driven by growth in tourism, information technology, financial services, trade, and logistics. In contrast, the primary sector's share declined from 11.2 per cent to 8.1 per cent over the same period. At constant (2011-12) prices, Gross State Domestic Product (GSDP) growth broadly tracked national trends, with a slowdown in 2019-20, a contraction in 2020-21 due to the Covid-19 pandemic, and a recovery thereafter. The tertiary sector, despite a sharp contraction in 2020-21, rebounded strongly in 2021-22 and continued to expand thereafter.

Growth of the Productive Forces

Agriculture and allied sectors

In 2016-17, Kerala was at the height of an agricultural decline. The contribution of agriculture to the GSDP was not just falling in relative terms, but the overall value of agricultural production itself was on an absolute

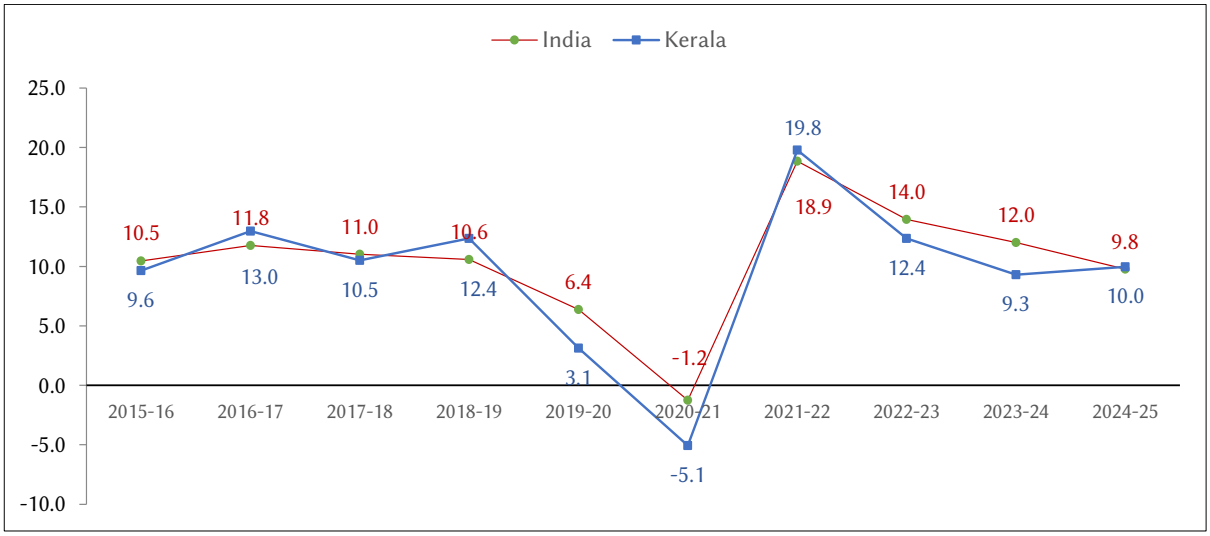

Figure 1.1 *Annual growth rate of nominal State income, Kerala and India, 2015-16 to 2024-25* in per cent
Source: Ministry of Statistics and Programme Implementation, Government of India

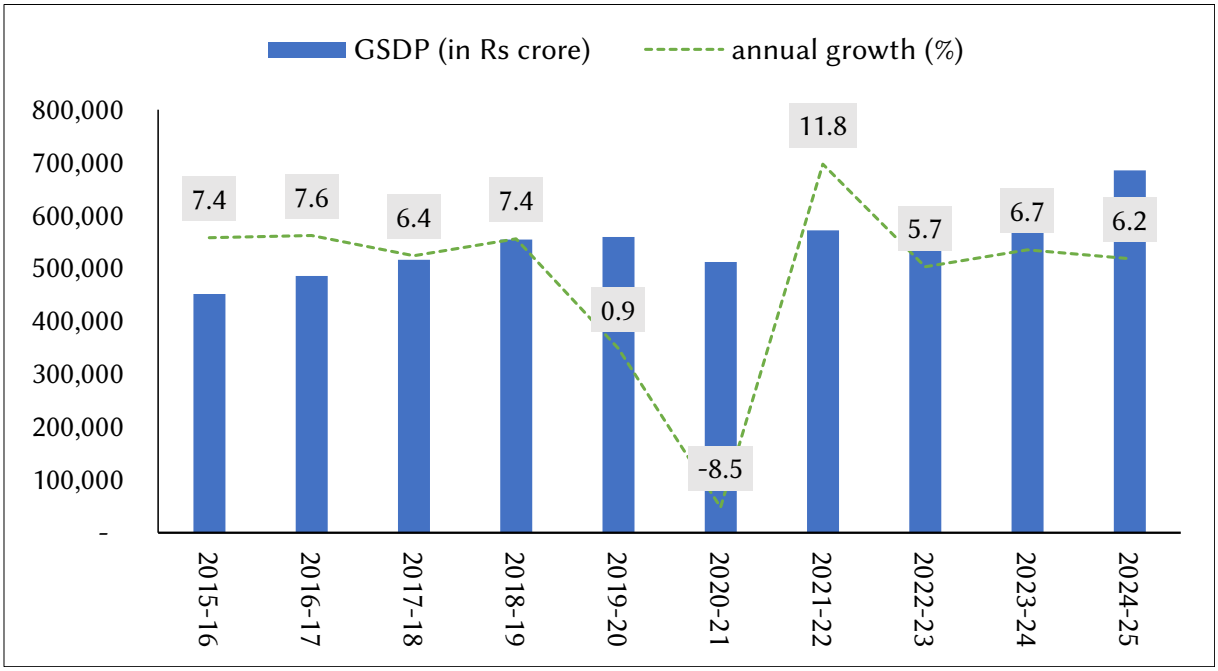

Figure 1.2 *Real Gross State Domestic Product, Kerala, 2015-16 to 2024-25* in Rs crore
Source: Ministry of Statistics and Programme Implementation, Government of India

decline. Conscious efforts were initiated in the State Plan to arrest this decline. However, a series of natural and policy-induced shocks derailed these efforts. The demonetisation of 2016 and the extreme monsoon events of 2018 and 2019 destabilised markets, and destroyed agricultural production in large areas of the State. The Covid-19 pandemic of 2020 and 2021 were further events that slowed down policy implementation.

The detailed and disaggregated data presented in this report, however, showed that sustained policy efforts bore fruit in the years that followed. Over the 14th Five-Year Plan period, the value of agricultural

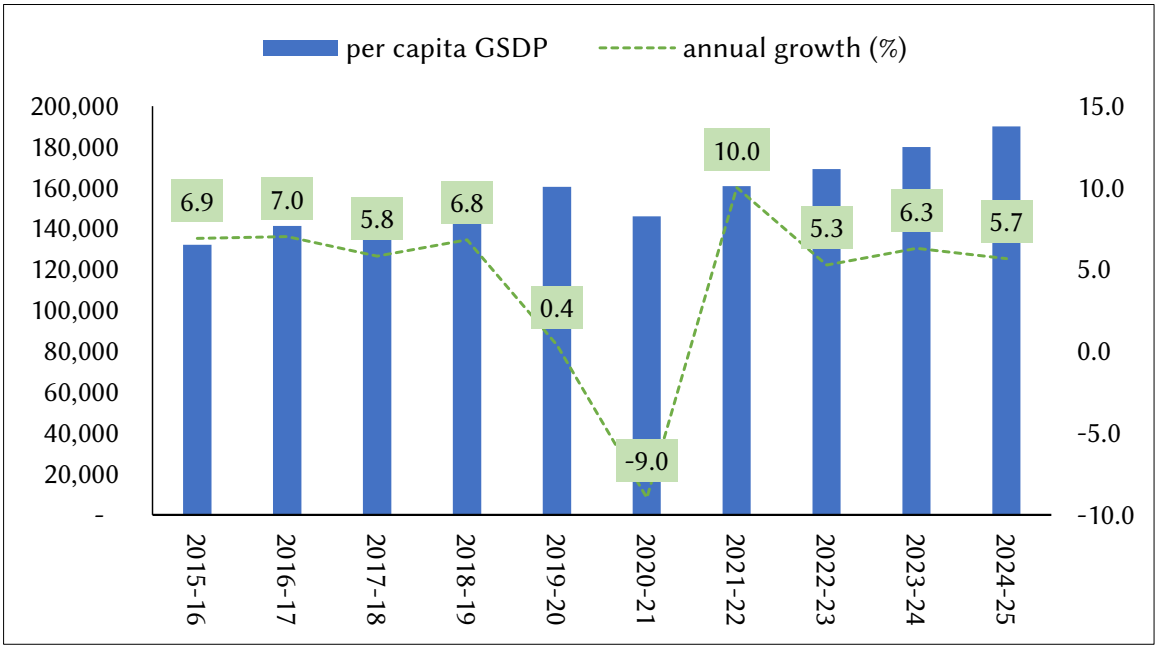

Figure 1.3 *Per Capita Gross State Domestic Product (constant prices), Kerala, 2015-16 to 2024-25* in Rs
Source: Ministry of Statistics and Programme Implementation, Government of India

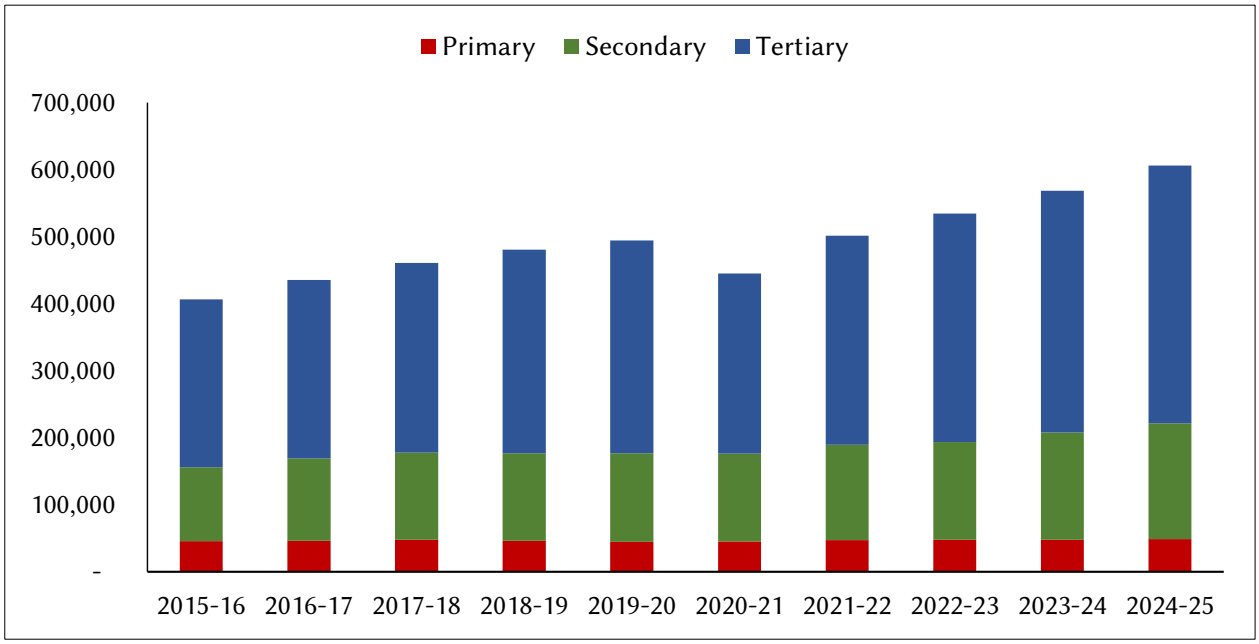

Figure 1.4 *Sectoral composition of Real Gross Value Added, Kerala, 2015-16 to 2024-25* in Rs crore
Source: Ministry of Statistics and Programme Implementation, Government of India

production in Kerala — in constant prices — sharply increased and more than covered the deficits of the previous decade. While the results were not striking in all crops, it was visible in rice, spice crops such as cardamom, and vegetables. The livestock sector held its ground and marginally increased production in value and quantity terms. It was in the fisheries sector that the growth was most visible, where production significantly increased in both the marine and inland sectors.

This report argues that further agricultural growth in Kerala must be based on a few pillars. In the crop sector, efforts must be focused on the improvement of productivity, expansion of micro-irrigation, introducing climate resilience, improved aggregation and marketing, and expanded investments in value addition. In the production, aggregation, and marketing sectors, Kerala must harvest the historical strength of its cooperative movement. In the livestock sector, increases in production and productivity must be focused on the twin tasks of breeding and feeding. In the fisheries sector, focus must be on the sustainable harvest of fish in the marine sector, and an intensive growth of the inland fisheries sector. The fish processing sector, which is primarily export-oriented, must expand its domestic and international footprint while also generating stronger backward linkages. For instance, raw material such as vanamei should be sourced within the State itself, rather than imported from distant States.

Industry

Kerala's industrial sector has undergone a major shift in the last decade. At constant prices, manufacturing Gross State Value Added rose by about 38 per cent between 2016–17 and 2024–25, accompanied by marked improvements in labour productivity and worker earnings that reached all-India levels by 2022–23. This turnaround has been driven by the rapid expansion of MSMEs, a shift of employment towards medium-, medium–high-, and high-technology industries, and the revival of State Public Sector Undertakings through modernisation and governance reforms, with the number of profit-making PSUs increasing to 14 by 2024–25 and PSU turnover rising by nearly 89 per cent since 2016–17.

A distinctive feature of Kerala's industrial transformation has been the emphasis on grassroots entrepreneurship through the Year of Enterprises campaign, under which more than 3.6 lakh MSMEs were registered between 2022–23 and November 2025, mobilising investments of over Rs 23,000 crore and generating more than 7.6 lakh jobs, with strong participation of women and socially disadvantaged groups. By February 2026, over 4 lakh MSME units have been started under Year of Enterprise. This initiative was anchored at the Local Self-Government (LSG) level through interventions such as Panchayat-level Samrambhaka Sabhas, which provided handholding

support, market access, and convergence of schemes, and through the One Local Body One Product programme, which enabled LSGs to identify and promote value-added enterprises based on local strengths. These decentralised efforts were complemented by major policy and institutional reforms, including the Kerala Investment Promotion and Facilitation Act, 2018, the MSME Facilitation Acts of 2019 and 2021, and the rollout of the K-SWIFT single-window clearance system.

Kerala's ease-of-doing-business reforms under the State Business Reforms Action Plan improved sharply from 22.8 per cent implementation in 2016 to 99.1 per cent in 2024, earning national recognition as a Fast Mover and Top Achiever in four reform areas. Together with park-led industrial development, large-scale investment promotion initiatives, and the adoption of a Responsible Investment, Responsible Industry framework under the 14th Five-Year Plan, these enterprise-focused and LSG-driven interventions have reshaped Kerala's industrial sector into a robust engine of economic growth.

Information Technology

Kerala's emergence as an IT hub has been backed by a strong policy framework, reinforced by the IT Policy 2017 and subsequent Plan interventions, which positioned technology as both an engine of economic growth and a tool for social empowerment. Plan investments of Rs 2,929.7 crore between 2016 and 2025 supported the expansion of digital infrastructure, skill development, and industry-ready systems. One of the most significant interventions has been the Kerala Fibre Optic Network (KFON), which operationalised the State's recognition of internet access as a basic right, providing free wifi in public spaces, connecting Government offices, and extending free connectivity to economically vulnerable households.

Kerala's IT industry has recorded strong quantitative and qualitative gains. The number of IT companies almost doubled from about 640 in 2016 to nearly 1,200 in 2025, while employment expanded from around 70,000 professionals to about 2.6 lakh during the same period. IT export earnings rose from approximately Rs 9,000 crore in 2016 to Rs 26,770 crore in 2025**,** reflecting significant structural and compositional changes. The State's three IT parks — Technopark, Infopark, and Cyberpark — registered growth in investment, built-up space, exports, and jobs, alongside international certifications and green campus recognition.

Kerala has also emerged as a nationally and globally recognised innovation hub. The Global Startup Ecosystem Report 2025 highlighted a 147 per cent increase in ecosystem value, placing the State among the world's leading ecosystems for affordable talent. The Kerala Startup Mission has driven this momentum, with registered startups rising from 800 in 2017–18 to over 7,100 by 2025–26, supported by expanded incubation space, rising investments, and inclusive, socially-relevant innovation. A distinctive feature of this growth has been the high participation of women, with women accounting for a significantly higher share of startup founders and the IT workforce compared to national averages, supported by targeted programmes for women entrepreneurs, gender-inclusive incubation spaces, and flexible work policies across IT parks.

Science and technology

Strong policy support under the 13th and 14th Five-Year Plans prioritised science, technology, and innovation for sustainable and inclusive growth. The State expanded its scientific infrastructure through the establishment of advanced institutions and platforms such as Kerala Space Park, the Innovation Centre for Graphene, the Kerala Genome Data Centre, the Kerala Medical Technology Consortium, the Institute of Advanced Virology, and the Kerala University of Digital Sciences, Innovation and Technology, significantly enhancing research depth and translational capacity. The Kerala State Council for Science, Technology and Environment (KSCSTE) supported fundamental and applied research, with its institutions achieving international recognition, including 27th rank among Indian Government institutions in the Nature Index 2025. Tangible innovation outcomes through these institutions include over 80 patents filed and more than 15 technologies readied for commercialisation by 2023–24, spanning agriculture, healthcare, water management, and climate resilience. Human capital development was strengthened through expanded fellowships and training, with around 400 PhDs awarded between 2016–17 and 2023–24, annual support to 250–500 research scholars, and structured programmes to promote women, people from Scheduled Castes and Scheduled Tribes, and persons with disabilities, in science. Science popularisation initiatives, including the Kerala Science Congress, National Children's Science Congress, and science museums, encouraged a strong scientific temper across society.

Tourism

Tourism in Kerala has benefitted from forward-looking policy reforms, and a strong commitment to sustainability, inclusivity, and high quality visitor experience. Investments have been made to strengthen destination infrastructure, diversify tourism products, build skilled human resources, and increase private-sector participation. A series of policy interventions — including the Tourism Policy 2017**,** Caravan Tourism Policy (2021)**,** Heli Tourism Policy (2024)**,** Cruise Tourism Policy (2025)**,** and the Kerala State Design Policy (2024) — expanded tourism beyond conventional circuits into offbeat, luxury, heritage, adventure, and community-based segments. These initiatives translated into strong demand outcomes. Domestic tourist visits increased from 124.7 lakh in 2015 to 250.6 lakh in 2025, surpassing historic highs. While foreign tourist visits have not recovered to pre-Covid levels, there has been a steady increase from 3.5 lakh in 2022 to 8.2 lakh in 2025. Tourism earnings rebounded to Rs 50,702.3 crore in 2025, exceeding the pre-Covid peak of Rs 45,010.7 crore (2019).

A defining feature of Kerala's tourism transformation has been the institutionalisation and scaling up of the Responsible Tourism (RT) Mission, which positions local communities at the centre of tourism development. Since its formal launch in 2017, the Mission has expanded to all Districts, linking around 1.5 lakh families, a majority of participants being women, to tourism value chains in agriculture, handicrafts, homestays, catering, and services. The RT Mission has generated substantial direct revenue, strengthened local procurement networks, reduced leakages, and enhanced destination sustainability. Complementary initiatives such as One Panchayat-One Tourism Destination, heritage and biodiversity circuits, and caravan tourism parks have widened the spatial spread of tourism benefits and reduced regional imbalances.

Kerala's achievements have received extensive national and international recognition. The State has won multiple awards from the United Nations World Tourism Organisation (UNWTO) for accessible and sustainable tourism practices, several Pacific Asia Travel Association (PATA) Gold and Grand Awards for destination marketing, digital platforms, and responsible tourism, and honours at the World Travel Market**,** India Today Tourism Awards, and National Tourism Awards. Global travel platforms such as Condé Nast Traveller and Lonely Planet have repeatedly ranked Kerala among the world's leading destinations for responsible, experiential, and family-friendly tourism.

Cooperative sector

Kerala's financial architecture stands out nationally for the scale, depth, and developmental role of its cooperative sector, which operates alongside, but often more intimately than, commercial banking institutions. By 2025, the State had built one of the most extensive cooperative credit networks in India, with nearly 850 Cooperative Banks and over 1,600 Primary Agricultural Credit Societies (PACS) providing near-universal village-level coverage. PACs mobilised nearly Rs 1.3 lakh crore in deposits by 2022, accounting for about 70 per cent of all PACS deposits in the country. Cooperatives consistently recorded credit-deposit ratios higher than those of commercial banks, highlighting their effectiveness in channeling local savings into agriculture, micro-enterprises, housing, and self-employment, especially in rural and semi-urban areas.

A major institutional milestone was the merger of the State Cooperative Bank and 13 District Cooperative Banks into Kerala Bank in 2019, which strengthened governance, capital adequacy, and lending capacity while retaining decentralised outreach. Cooperative institutions played a critical counter-cyclical role during floods, the Covid-19 pandemic, and economic disruptions by implementing interest subvention schemes, debt relief, emergency credit, and last-mile delivery of Government support, reinforcing their importance as development institutions rather than purely financial intermediaries.

Within this strong cooperative framework, commercial banking expanded rapidly in scale. By March 2025, Kerala had over 8,000 commercial bank branches, accounting for about 4 per cent of India's total, despite the State having only 2.6 per cent of the national population, with a spatial density of one branch per 5.5 square kilometres. With the high density of banking service availability, nearly universal bank account ownership, and a robust digital footprint, Kerala was declared the first fully digital banking State in India in January 2023.

Local Self-Governments

Kerala's development is characterised by decentralised and participatory governance. Local Self-Governments (LSGs) have been further empowered in the last decade, with the share of the State Plan devolved to LSGs rising

from 22.9 per cent in 2016–17 to 28.5 per cent in 2026–27, alongside increases in untied transfers such as the General Purpose Fund and the Maintenance Fund. Formula-based devolution ensured equitable distribution across regions; enhanced allocations to LSG Scheduled Caste Sub-Plans and Tribal Sub-Plans have contributed to equity. Women Component Plans, and Plans for special groups such as the elderly, children, and persons with disability within LSG Annual Plans have strengthened targeted interventions for marginalised communities.

Institutional and procedural reforms under the 13th and 14th Five-Year Plans simplified planning processes, enabled early Annual Plan finalisation, expanded the scope for innovative projects, and introduced working groups on climate change, biodiversity, and disaster management. These reforms translated into concrete development outcomes. LSGs are key in localising and implementing programmes across sectors including health, education, industry, skilling, palliative care, infrastructure development, agriculture and allied sectors, tourism, and disaster management. LSGs became central actors in poverty alleviation, culminating in Kerala's declaration as India's first State to eradicate extreme poverty on November 1, 2025. Housing outcomes were especially significant, with 4,71,442 houses completed under the LIFE Mission by October 2025, and over 5 lakh houses by February 2026, including substantial coverage of SC and ST households. The competence and efficiency of LSGs in Kerala were clearly demonstrated through the pivotal roles they played in managing and coordinating relief efforts during the 2018 floods and the Covid-19 pandemic.

LSGs are engines for local economic development, and employment generation through decentralised mechanisms was equally impactful: between 2016 and 2025, Kerala generated 6–10.5 crore person-days annually under MGNREGS, with women contributing nearly 90 per cent of total person-days, while the Ayyankali Urban Employment Guarantee Scheme created nearly two crore person-days over this period. A cornerstone of Kerala's local economic development strategy has been the integration of Kudumbashree within decentralised governance. With a grassroots network of 3.2 lakh neighbourhood groups and 48 lakh women members, Kudumbashree, working closely with LSGs, has driven micro-enterprise development, collective farming, service delivery, and social entrepreneurship. LSGs have supported MSMEs and community enterprises through back-end subsidies, interest subvention, innovation and incubation funds, crisis management support, and technology upgradation, enabling women, youth, and marginalised groups to participate actively in the local economy. Complementary skill development initiatives, implemented in partnership with State and national missions, have strengthened employability and enterprise readiness at the local level.

Urban LSGs have led major improvements in housing, drinking water, sanitation, solid waste management, mobility, and improved public spaces, supported by increased Plan allocations and convergence with national missions, as well as externally aided projects. The constitution of the Kerala Urban Policy Commission in 2023, the first in India, provided an evidence-based framework for urban development. Together with strong digital governance platforms, and the integrated K-SMART system, these initiatives enabled LSGs to deliver measurable improvements in service delivery, livelihoods, and quality of life.

Transport

Kerala's transport sector has emerged as a key enabler of economic growth, regional integration, and improved quality of life through public investment, institutional reform, and adoption of modern, sustainable technologies. Roads remain the backbone of mobility, and Kerala today has one of the highest road densities in the country, with about 5.3 km of road per 1,000 population and nearly 4,992 km per 1,000 sq km, far above the national average. Between 2016–17 and 2024–25, major corridor projects such as the Hill Highway and Coastal Highway, alongside rapid four-laning of National Highways, and modernisation of PWD roads, have significantly reduced travel time and strengthened connectivity.

Public transport revival has been another major achievement. After severe Covid-era disruptions, KSRTC has stabilised and improved performance through fleet augmentation, IT-enabled route optimisation, and depot modernisation. Workshop modernisation has accelerated turnaround in repairs, leading to significant reduction in the number of off-road buses. Average daily ridership recovered from about 10 lakh passengers during the pandemic to over 20 lakh by 2025, while daily revenue rose to over Rs 700 lakh, reflecting improved operational efficiency. Simultaneously, Kerala has positioned itself as a national leader in green mobility: electric vehicle registrations surged from just 417 in 2019–20 to about 2.3 lakh by

March 2025, supported by tax incentives and expanding charging infrastructure.

Multimodal innovations have further strengthened the sector. The Kochi Metro, now operating at scale, crossed 350 lakh passengers in 2024 and moved into operating profits. The Kochi Water Metro, India's first of its kind, rapidly expanded its network and ridership, demonstrating the viability of clean inland water transport. The commissioning of the Vizhinjam International Deep-Water Seaport in 2024 marked a historic milestone: within a year, it handled over 13 lakh containers of Twenty-Foot Equivalent Units from more than 600 vessels, positioning Kerala on global shipping routes and opening new avenues for port-led growth.

Energy

Over the last decade, Kerala's energy sector has been marked by growth in capacity, a shift towards renewables, and improved systems and infrastructure. The State achieved full electrification in 2017 and has since maintained uninterrupted power supply without load shedding, while reducing Aggregate Technical and Commercial losses sharply from 13.9 per cent in 2016–17 to 6.61 per cent in 2024–25, placing Kerala among the best-performing States in power distribution. Total installed capacity expanded from by over 48 per cent between 2016–17 and 2024–25. Solar power emerged as the most dynamic segment, rising from just 2.8 per cent to 34.4 per cent of capacity, driven by flagship initiatives such as the Soura programme and large-scale rooftop solar deployment, which reached about 1.5 GW by August 2025. Major investments during the 13th and 14th Five-Year Plans strengthened transmission and distribution through programmes such as Transgrid 2.0 and Dyuthi, including the commissioning of Kerala's first 400 kV gas-insulated substation, new power corridors, and an expansion of import capacity by nearly 1,000 MW. On the demand side, per capita electricity consumption increased by about 38 per cent between 2016–17 and 2024–25, reflecting economic growth and improved access. The State has launched the Hydrogen Valley Innovation Cluster (HVIC), covering the entire hydrogen value chain from production to end-use and research and development. Kerala's advances in energy efficiency and green transition have earned national recognition, including top rankings in NITI Aayog's State Energy and Climate Index for accessibility, affordability, and reliability.

Land survey

A landmark initiative of the Government of Kerala in the last decade is the Ente Bhoomi mission, initiated in 2022. Reliable, current, and digitised land management is being facilitated with the use of modern technology and digital tools to survey land parcels with precision, manage land records, enable ease of citizen access, and better administration, including improved inter-departmental alignment. Ward-level public forums for citizen awareness and stakeholder participation ensure transparency and resident involvement in the generation of these land records. These outcomes have positioned Kerala as a best practice at the national level.

Environment and growth

Environmental conditions have influenced growth strategies and public policy in Kerala in the last decade. The State combines low emission intensity with high ecological vulnerability. In 2021, Kerala's gross greenhouse gas emissions were about 21.9 million tonnes of CO_2e, of which nearly 47 per cent was offset through carbon sequestration from land use and forestry, leaving net emissions of around 11.6 million tonnes. With forest and tree cover accounting for nearly 55 per cent of the State's area, and widespread cultivation of perennial crops such as coconut, rubber, coffee and arecanut, Kerala functions largely as a carbon sink. Agriculture contributes only about 7 per cent of total emissions and remains effectively carbon-negative, even while sustaining dense rural livelihoods.

Despite its low emissions footprint, Kerala has faced an unprecedented sequence of climate- and ecology-related shocks since 2016. Cyclone Ockhi (2017), the floods and landslides of 2018 and 2019, extreme rainfall events, droughts, coastal erosion, disease outbreaks such as Nipah, and the Covid-19 pandemic placed extraordinary stress on infrastructure, livelihoods, and ecosystems. A key strength of disaster management in Kerala has been its blend of decentralised, participatory governance with firm coordination from the top, focusing on immediate relief and long-term rehabilitation. LSGs, community networks, volunteers, and civil society supported relief and rehabilitation efforts, backed by clear political leadership and swift resource mobilisation.

A distinctive environmental challenge has been the intensification of the human–animal interface. The response combines immediate risk reduction with long-term ecological management. Rapid Response Teams, handling around 20,000 wildlife rescue operations annually, solar fencing, Forest Emergency Operation Centres, and community-based initiatives such as SARPA, which has enabled over 50,000 snake rescues since 2019, have reduced fatalities and losses.

Technology-driven solutions are complemented by landscape-level planning across 12 major conflict zones, habitat restoration, and voluntary relocation with rehabilitation support.

Long-term resilience was institutionalised through the Rebuild Kerala Initiative (RKI) launched in 2019. By July 2025, Rs 8,773.5 crore had been sanctioned across 115 projects, with nearly 62 per cent already spent, supported by international financing exceeding USD 600 million. Scientific risk assessments, river-basin–based planning, resilient infrastructure standards, and strengthened early-warning systems have significantly improved Kerala's anticipatory capacity.

Environmental action has also supported everyday growth through the Haritha Keralam Mission, launched in 2016. The Mission enabled rejuvenation of over 97,000 km of streams, restoration of nearly 30,000 ponds, construction of nearly 25,000 new ponds, recharge of over 73,000 wells, and construction of more than 82,000 temporary check dams. In solid waste management, daily processing capacity rose from about 7,350 tonnes in 2016–17 to over 10,000 tonnes by 2025–26, while source segregation increased to 94 per cent. The women-led Haritha Karma Sena expanded from 5,000 members in 2017 to nearly 38,000 by 2025, linking environmental governance with livelihoods.

Human Development

Education

Since 2016, Kerala's school and higher education sectors have undergone a widely recognised transformation, reflecting the State's objective to emerge as a knowledge economy. In school education, the revival of the public system through the Pothuvidyabhyasa Samrakshana Yajnam under the Navakeralam Karma Padhati has been particularly striking. Under the Vidyakiranam Mission, the second edition of the Pothuvidyabhyasa Samrakshana Yajnam, large-scale investments in school infrastructure, teacher professional development, curriculum renewal, IT-enabled education, and inclusion-focused interventions have significantly improved learning environments and outcomes. According to the UDISE+ 2024–25 Report, Kerala's Net Enrolment Ratios at the primary, upper primary, secondary, and higher secondary levels exceed national averages, while retention rates remain above 95 per cent across all stages up to secondary education, with minimal gender gaps. The State has achieved zero per cent dropout at preparatory and middle school levels, and dropout rates among Scheduled Caste and Scheduled Tribe students are among the lowest in India. The improved outcomes are clear in Kerala's consistent top ranking in NITI Aayog's School Education Quality Index, its placement in the highest category of the Performance Grade Index of the Ministry of Education, and its improved standing in the PARAKH Rashtriya Sarvekshan 2024, where it ranked second nationally. Kerala has also been declared India's first fully digital State in school education, with technology-enabled classrooms in all Government and aided schools for Classes 8–12, and digital labs in primary and upper-primary schools.

In higher and technical education, the Government initiated wide-ranging reforms in curriculum design, governance, and institutional structures. Significant resources were directed towards modernising campuses, strengthening faculty development, and expanding research and innovation capacity, with Kerala remaining among the highest spenders on higher education per youth in the country. To steer long-term reform, three expert commissions were constituted: for Reforms in Higher Education, for Reforms in Examination in the Universities and Higher Education Institutions, and for Kerala State University Law Reforms. These efforts are reflected in improved national rankings, with Kerala's public universities and colleges recording notable gains in the NIRF India Rankings 2025 and a growing number of institutions featuring among the country's top-ranked universities and colleges. The establishment of the Sree Narayana Guru Open University and India's first Digital University, multiple new Centres of Excellence, and initiatives such as Vijnana Keralam for large-scale skilling and placement, signal Kerala's transition towards a future-ready, high quality, and inclusive higher education sector.

Health

Kerala's medical and public health sector has been comprehensively strengthened through a rights-based, people-centred strategy that builds on the State's historic achievements while addressing emerging demographic, epidemiological, and systemic challenges. Guided by the 13th and 14th Five-Year Plans, public policy focused on expanding access to high-quality preventive, curative, and palliative care through a revitalised public health system. The Aardram Mission became the cornerstone of this transformation, converting primary facilities into people-friendly Family Health Centres, upgrading secondary and tertiary hospitals, extending service hours, and embedding quality assurance through State and national accreditation frameworks. These

reforms were supported by a substantial expansion of human resources, with over 10,000 additional posts created across health departments, alongside steady growth in hospital bed capacity and improved doctor–bed ratios within the Government sector, resulting in increased public utilisation of State-run facilities. Measures towards addressing the growing burden of non-communicable diseases (NCDs) has been a defining feature of this period. State-wide screening, early detection, and continuity-of-care programmes for diabetes, hypertension, cancer, stroke, chronic respiratory diseases, mental health conditions, and elderly and palliative care have been integrated into routine services, supported by strengthened diagnostics and digital health platforms. The Karunya Arogya Suraksha Padhathi (KASP), which consolidates multiple insurance schemes into a comprehensive assurance-based model, offers cashless coverage of up to Rs 5 lakh to over 42 lakh families, substantially reducing out-of-pocket expenditure. The One Health initiative has been launched to facilitate the surveillance of zoonotic and emerging diseases and their causative factors.

These systemic interventions have translated into consistently superior outcomes on key health indicators. Kerala continues to lead nationally in life expectancy, infant and maternal mortality rates, and overall population health outcomes, and ranks first among larger States in the NITI Aayog Health Index for progress towards the Sustainable Development Goals. The State has received multiple national and international accolades, including the Arogya Manthan Award for excellence in health insurance implementation and a United Nations Inter-Agency Task Force Award for leadership in non-communicable disease control. Strengthened infrastructure, expanded staffing, targeted disease control, financial protection, and strong governance have positioned Kerala as a national exemplar of equitable, and modern public healthcare.

Women and children

Kerala's approach to women's and children's development integrates social protection, human development, economic empowerment, and institutional accountability. Long-standing commitments to gender budgeting, decentralised planning, and inclusive governance have translated into consistently superior outcomes across education, health, and social indicators. Women in Kerala record near-universal literacy, high levels of educational attainment, and the highest life expectancy in the country, alongside nationally leading outcomes in infant and maternal mortality, sex ratio, and institutional deliveries. These outcomes reflect sustained investments in education, healthcare, nutrition, and social security, complemented by pioneering institutional innovations such as Kudumbashree, which has emerged as a globally recognised model for women's collective empowerment, livelihoods, and local economic development. The creation of a dedicated Department of Women and Child Development, systematic expansion of gender budgeting — now accounting for over one-fifth of the Plan outlay — and interventions to enhance women's workforce participation, entrepreneurship, safety, and access to credit have strengthened women's agency across social and economic spheres.

Child development and protection policy in Kerala is guided by the principles of the UN Convention on the Rights of the Child. Kerala's child outcomes remain among the best in India, with low birth and child mortality rates, high immunisation coverage, favourable sex ratios, and significantly lower levels of stunting, wasting, underweight prevalence, and childhood anaemia compared to national averages. Early childhood care is delivered through an extensive ICDS network of over 33,000 anganwadi centres, complemented by best practices such as the daily provision of eggs and milk, the First 1,000 Days Programme, and universal newborn screening for congenital and developmental conditions. Nutritional support continues into school levels, with nearly 25 lakh children benefiting from the Mid-Day Meal programme. School health and wellness programmes, disability screening initiatives, and District Early Intervention Centres ensure early detection and continuity of care. A child protection architecture comprising Child Welfare Committees, District Child Protection Units, foster care and adoption services, child-friendly police stations, Childline 1098, and fast-track POCSO courts ensures prevention, timely intervention, and rehabilitation. Community-based institutions such as Balasabhas, Jagratha Samithis, and LSGs embed child rights into grassroots governance.

Social justice

Kerala's social justice framework addresses structural disadvantage through inclusive legislation, targeted programmes, and decentralised service delivery, with income security, dignity, accessibility, and participation as core principles. The empowerment of persons with disabilities constitutes a central pillar of Kerala's social justice agenda, guided by the UN Convention on the Rights of Persons with Disabilities and the Rights of

Persons with Disabilities Act, 2016. A shift from welfare to capability-based inclusion is reflected in expanded disability pensions and caregiver allowances, alongside investments in early intervention, assistive technologies, inclusive education, and livelihood support. Equal emphasis has been placed on creating barrier-free physical and digital environments, with mandatory access standards in public buildings and spaces. These efforts have received national recognition, including the Best State Award for Empowerment of Persons with Disabilities.

More than three-fourths of the elderly in Kerala are covered by pension schemes. Pension security is complemented by elderly-friendly and barrier-free health and social infrastructure. Schemes such as Vayomithram**,** Sayamprabha, dementia care through Smruthipadham**,** home-based palliative care, and cashless treatment under KASP address health, care, and social participation needs. Local Self-Governments (LSGs) function as critical service delivery units, and are empowered to allocate 5 per cent of their Development Funds to elderly welfare. The establishment of the Kerala State Elderly Commission further strengthens legal protection and accountability.

As the first State in India to adopt a comprehensive Transgender Policy, the Government of Kerala has institutionalised self-identification, non-discrimination, and access to education, healthcare, housing, employment, and social security. A wide range of initiatives including Transgender Justice Boards, the Mazhavillu scheme, support for gender-affirming health care, education and housing assistance, self-employment loans, and MSME promotion, as well as violence-prevention efforts through sensitisation programmes, a 24/7 helpline, crisis support, and public awareness campaigns contribute to ensuring equality and dignity of transgender people in Kerala.

Scheduled Caste and Scheduled Tribe development

Kerala's approach to Scheduled Caste and Scheduled Tribe development is based on constitutional guarantees of equality and social justice, reinforced by fiscal prioritisation and outcome-oriented public policy interventions across education, employment, livelihoods, housing, and social protection. A defining feature of the State's planning framework is that allocations under the Scheduled Caste Sub-Plan and Tribal Sub-Plan consistently exceed the population shares of SC and ST people.

Education has been positioned as the primary driver of social mobility. Kerala provides a comprehensive continuum of support through pre- and post-matric scholarships, residential schools and hostels, study rooms through the Padanamuri scheme, free learning materials, digital access, and coaching for competitive examinations. Targeted assistance for professional, postgraduate, and overseas education has expanded representation of SC and ST students in medicine, engineering, law, and other high-skill domains. Employment and livelihood strategies combine statutory reservation in public services with proactive labour-market interventions. Recruitment through public service channels is complemented by skill development, apprenticeships, entrepreneurship support, and enhanced wage employment. Initiatives such as Kerala Tribal Plus, which extends guaranteed employment days for tribal households beyond national norms, and support for self-employment, cooperatives, and forest-based livelihoods have strengthened income security. Improved access to social security pensions, health protection, and credit further reinforces these gains.

Together with investments in land distribution, housing under the LIFE Mission, settlement development, and legal safeguards under the Prevention of Atrocities framework, Kerala's SC and ST development model demonstrates how constitutional intent can translate into durable social and economic outcomes.

Food security, nutrition, and drinking water

Kerala's approach to food security, nutrition, and basic services integrates universal access, price stabilisation, and strong public provisioning to protect households from vulnerability while improving long-term health outcomes. The Public Distribution System (PDS) operates as a near-universal safety net, with nearly 95 lakh ration card–holding households, including both priority and non-priority groups. Beyond subsidised cereals, the State actively intervenes in markets through its civil supplies network to control inflation in essential commodities, moderating price volatility. These measures have helped Kerala maintain lower food-price inflation compared to national trends. During crises such as floods and the Covid-19 pandemic, the PDS demonstrated exceptional efficiency, with free food kits distribution ensuring uninterrupted access to

essential food items. End-to-end digitisation through e-PoS devices, Aadhaar seeding, portability, and online grievance redressal has enhanced transparency, while mobile ration shops and doorstep delivery have improved access for tribal, coastal, and remote populations.

These distribution and price-stabilisation mechanisms are reflected in strong nutrition outcomes. Kerala consistently ranks first among Indian States on SDG 2 (Zero Hunger) and records the highest per capita protein intake among major States. Child nutrition indicators show significantly lower levels of stunting, wasting, and underweight prevalence compared to national averages, supported by complementary interventions through ICDS, mid-day meals, anganwadi supplementation, and community kitchens for vulnerable groups.

Parallel progress in drinking water and sanitation has reinforced public health gains. While being water-abundant, with wells being the primary source of water for a significant proportion of the population, piped water coverage in Kerala has expanded rapidly. The Government of Kerala has built one of the most extensive NABL-accredited water quality monitoring networks in the country. Investments in rainwater harvesting, groundwater recharge, decentralised wastewater management, and sewerage expansion address sustainability and environmental protection.

Workers' rights

Kerala has remained at the forefront of protecting workers' rights, with strong unions, worker cooperatives, welfare boards and pension schemes, workplace inclusivity measures for women and for vulnerable communities, and the protection of migrant rights. The State's exceptional human development foundations have been leveraged to deliver sustained improvements in labour markets, workforce quality, migrant integration, and engagement with its global diaspora, transforming demographic and structural challenges into inclusive growth. Even as the State faces age-related changes in demographic structure, workforce participation has risen sharply. Between 2017–18 and 2023–24, Kerala's labour force participation rate increased by nearly 10 percentage points, driven largely by women; rural female participation alone rose from around 26 per cent to over 44 per cent. Employment quality has also improved, with a higher share of regular work than the national average, declining casualisation, and wage levels among the highest in India. These outcomes are a result of the State's broad focus on economic growth, as well as targeted programmes such as the skilling initiatives of ASAP, KASE, technical institutes such as ITIs and Polytechnics, and employment initiatives such as the Kerala Knowledge Economy Mission, and the Year of Enterprise programmes, as well as wage employment through MGNREGS and AUEGS.

Kerala has simultaneously emerged as a national leader in migrant worker welfare, supporting interstate workers through rights-based measures such as the AAWAZ insurance scheme, Apna Ghar housing facilities, language and literacy programmes like Changathi, and exemplary crisis management during the Covid-19 pandemic. Equally significant has been the State's structured engagement with its Non-Resident Keralites (NRKs), who remain central to Kerala's economy and social transformation.

With remittances consistently accounting for over one-third of State Domestic Product, Kerala has institutionalised diaspora welfare and investment support through the Department of Non-Resident Keralites' Affairs (NORKA). Interventions include welfare funds, pension and insurance schemes, legal aid, repatriation support during crises, and targeted programmes for return migrants, such as skill reorientation, entrepreneurship assistance, and rehabilitation packages. The Pravasi Dividend and investment facilitation initiatives have sought to channel diaspora savings into productive sectors, while dedicated support during the pandemic and geopolitical crises emphasised the State's commitment to migrant welfare abroad and reintegration at home.

Progressive labour legislation, strong welfare institutions such as Labour Welfare Boards, and dedicated enforcement mechanisms such as the Wage Protection System, have reinforced income security and dignity of work for workers in Kerala.

Arts, culture, sports and youth affairs

The Government of Kerala has significantly strengthened arts, culture, sports, and youth development ecosystems. Public investment rose sharply, with allocations for culture, museums, archaeology, and heritage recording a 30 per cent year-on-year increase in the Annual Plan 2026–27, reflecting a renewed commitment to preserving heritage while supporting progressive values. Internationally recognised platforms such as the International Film Festival of Kerala

expanded in scale and global reach, while major institutional reforms improved infrastructure, archives, and museums across the State. Artist livelihood security was a priority, with innovative schemes such as the Diamond Jubilee Fellowship supporting 1,000 young artists across 45 art forms, women-led initiatives like Samam promoting gender equality in culture, and large-scale relief during Covid-19 reaching over 60,000 artists. Kerala also undertook a transformative push in sports and youth affairs. Plan outlays for sports rose by nearly 160 per cent between 2016–17 and 2026–27, backed by over Rs 3,500 crore for infrastructure, including new District stadiums, synthetic tracks, academies, and India's first stadium for persons with disabilities. The Kerala Sports Policy 2023, based on the principle of "Sports for All," integrated inclusivity, decentralisation, and the development of a sports economy, with the International Sports Summit Kerala 2024 securing investment commitments exceeding Rs 5,000 crore. Grassroots programmes such as One Panchayat One Playground, Goal, Sprint, and Healthy Kids broadened participation, while targeted initiatives expanded access for women, coastal communities, and marginalised youth. Together, these interventions demonstrate how Kerala has leveraged culture, sports, and youth development as modes of inclusion, employment, global recognition, and long-term social progress.

The Government of Kerala is thus committed to widening and deepening its investments in the people and to economic growth. It will do so while maintaining its commitment to leaving no person behind. The Kerala Development Report 2026 offers a description and analysis of the development record of the State, with a special focus on the period from 2016 to 2026. It also presents perspectives for the future development of different sectors of the economy and society. The objective of its authors is to encourage discussion, and to contribute further to the processes of planning and development for the people in the State.

Chapter 2
Mobilising Finances for Growth and Enhanced Economic Performance

Over the past decade, the Government of Kerala has used fiscal policy to support economic growth, extend social commitments, and strengthen public institutions. The State economy has had to deal with financial constraints that have been imposed on it by the Union Government. Despite this, the Government of Kerala is committed to building *Nava Keralam* – and to do so by investing in people's welfare and promoting income-generating activities across sectors.

When the Left Democratic Front (LDF) Government assumed office in Kerala in 2016, it reaffirmed the commitment to social provisioning- to the working people, the poor, and socially disadvantaged groups. The Government determined that it would use Kerala's historic achievements in human development as a springboard for enhanced economic growth in the spheres of production, infrastructure, and a range of income-bearing services. The challenge was to augment investment and capital expenditure while sustaining welfare commitments and strengthening public institutions in the social sectors, especially, in health and education. This was particularly challenging in the context of the emerging fiscal constraints faced by the State in both revenue and expenditure fronts and reduced State-level fiscal autonomy.

Kerala remains the only State in India to continue with Five-Year and Annual Plans to guide economic development; economic planning is a crucial instrument in its effort to meet the challenges imposed by the inequalities of Centre-State financial relations.

The past decade saw multiple economic disruptions, in the form of drought, cyclone Ockhi, extreme rainfall events in consecutive years in 2018 (which affected 13 out of the 14 Districts in the State and around 54 lakh people, roughly one-sixth the population) and in 2019. The past decade also saw public health issues such as Nipah and the multiple effects of the Covid-19 pandemic. On the economic front, the State faced the adverse effects of the demonetisation exercise in 2018 and the inequities of the Goods and Services Tax, along with frequent administrative changes.

Despite these challenges, the Government of Kerala achieved substantial progress in implementing its commitments.

Key Fiscal Indicators

The trends in revenue mobilisation, expenditure management, capital outlay, and declining central transfers provide the context for understanding Kerala's State finances. Over the past decade, the State's fiscal trajectory reflects a gradual recovery from natural calamities and pandemic-related disruptions, alongside sustained efforts to strengthen own revenues and improve expenditure efficiency.

The State's Own Tax Revenue (SOTR) has increased from Rs 38,995 crore in 2015-16 to Rs 83,731 crore in 2025-26 (RE), supported by improvements in tax administration, reforms under the GST framework, and compliance efficiency. Revenue self-sufficiency has improved, with the State financing about 64 per cent of its revenue expenditure through its own receipts in 2023–24, and 60 per cent in 2024-25. These figures are higher than the all-State average of 56 per cent in 2023-24 and 55 per cent in 2024-25 RE.[1]

The State's total expenditure increased from Rs 87,032 lakh crore in 2015-16 to Rs 1,73,808 lakh crore in 2024–25, reflecting both the expansion of public services, and the fiscal response to successive crises.

Debt sustainability

Kerala's debt-to-GSDP ratio peaked at 38.47 per cent in 2020–21, during the Covid-19 pandemic (as had happened at the all-India level and internationally). Since then, it has declined steadily, reaching 34.87 per cent in 2024–25 (Provisional), supported by economic recovery, improved revenue buoyancy, and expenditure rationalisation. Kerala's debt indicators remain within the norms imposed on the States by the Union Government (Table 2.2).

The above data and information clarify that the fiscal stress in Kerala is not a consequence of fiscal indiscipline. The source of Kerala's fiscal woes lies in the structural constraints of federal fiscal architecture.

Increasing reliance on Own Tax Revenue

Kerala's fiscal trajectory over the past decade indicates a gradual but decisive shift towards greater reliance on State Own Revenue. The share of own revenue in total revenue receipts has increased steadily, reflecting improved tax administration, enhanced compliance under the GST regime, and growth in key own-tax sources such as excise, motor vehicles tax, and stamp duty. At the same time, non-tax revenue mobilisation has benefited from administrative reforms and improved collection efficiency.

In contrast, the share of central transfers in total receipts have consistently declined, reflecting both

[1] State Finances: A Study of Budgets, Reserve Bank of India

Table 2.1 *Key fiscal indicators, Kerala, 2015-16 to 2023-24* in Rs crore

Items	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Revenue Receipts	69,033	75,612	83,020	92,854	90,225	97,617	1,16,640	1,32,725	1,24,486
State's Own Tax Revenue	38,995	42,176	46,460	50,644	50,323	47,661	58,341	71,968	74,329
Growth Rate (per cent)	10.68	8.16	10.16	9.01	-0.63	-5.29	22.41	23.36	3.28
State's Own Non-Tax Revenue	8,426	9,700	11,200	11,783	12,265	7,327	10,463	15,118	16,346
Growth Rate (per cent)	15.68	15.12	15.46	5.21	4.09	-40.26	42.80	44.49	8.12
State's Own Revenue	47,421	51,876	57,660	62,427	62,588	54,988	68,804	87,086	90,675
Growth Rate (per cent)	11.53	9.39	11.15	8.27	0.26	-12.14	25.13	26.57	4.12
Central Govt. Transfers	21,612	23,735	25,361	30,427	27,636	42,629	47,837	45,639	33,811
Growth Rate (per cent)	40.03	9.82	6.85	19.98	-9.17	54.25	12.22	-4.59	-25.92
Capital Receipts	17,965	26,763	27,221	27,242	24,068	41,171	46,498	26,490	35,113
Total Receipts	86,998	1,02,374	1,10,241	1,20,096	1,14,293	1,38,788	1,63,138	1,59,215	1,59,599
Revenue Expenditure	78,689	91,096	99,948	1,10,316	1,04,720	1,23,446	1,46,180	1,41,951	1,42,626
Capital Expenditure	8,342	11,286	10,289	9,753	9,665	15,438	17,046	16,787	16,880
Total Expenditure	87,032	1,02,383	1,10,238	1,20,069	1,14,385	1,38,885	1,63,225	1,58,739	1,59,506
Revenue Surplus (+)/Deficit (-)	9,657	15,485	-16,928	-17,462	-14,495	-20,064	-20,800	-9,226	-18,140
Fiscal Deficit	17,818	26,448	-26,837	-26,958	-23,837	-35,204	-37,306	-25,555	-34,258
GSDP (Current Prices)	5,61,994	6,34,886	7,01,588	7,88,286	8,12,935	7,71,724	9,24,465	10,38,734	11,35,372
Growth Rate (per cent)	9.64	12.97	10.51	12.36	3.13	-5.07	19.79	12.36	9.30
RD as per cent of GSDP	1.72	2.44	-2.41	-2.22	-1.78	-2.60	-2.25	-0.89	-1.60
FD as per cent of GSDP	3.17	4.17	-3.83	-3.42	-2.93	-4.56	-4.04	-2.46	-3.02

Source: Finance Department, Government of Kerala

Table 2.2 *Debt indicators, Kerala, 2015-16 to 2024-25* in Rs crore

Items	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022- 23	2023-24	2024-25
Revenue Receipts	69,033	75,612	83,020	92,854	90,225	97,617	1,16,640	1,32,725	1,24,486	1,24,861
Outstanding Debt	1,57,370	1,86,454	2,10,762	2,35,631	2,60,311	2,96,901	3,35,641	3,62,192	3,91,934	4,35,314
Growth Rate of Debt	16.19	18.48	13.04	11.80	10.47	14.06	13.05	7.91	8.21	11.07
GSDP (Current Prices)	56,1,994	6,34,886	7,01,588	7,88,286	8,12,935	7,71,724	9,24,465	10,38,734	11,35,372	12,48,533
Growth Rate of GSDP (per cent)	9.64	12.97	10.51	12.36	3.13	-5.07	19.79	12.36	9.30	9.97
Debt as a per cent of GSDP	28.00	29.37	30.04	29.89	32.02	38.47	36.31	34.87	34.52	34.87
Debt-Revenue Receipts Ratio	2.28	2.47	2.54	2.54	2.89	3.04	2.88	2.73	3.15	3.49
Interest Payments	11,111	12,117	15,120	16,748	19,215	20,975	23,303	25,176	26,986	29,138
Interest Payments as a per cent of Revenue Receipts	16.10	16.03	18.21	18.04	21.30	21.49	19.98	18.97	21.68	23.34
Effective Interest Rate	7.59	7	7	7.11	7.38	7.06	6.94	6.95	6.87	7
Domar Gap*	2.05	5.97	3.51	5.25	-4.25	-12.13	12.85	5.41	2.43	2.97

Source: Finance Department, Government of Kerala
Note: *Domar gap is the difference between the rate of growth of the economy and the interest rate on public debt, often used to assess debt sustainability.

broader changes in the federal fiscal landscape, and the changes in Union Finance Commission devolution.

Despite notable progress in fiscal management, Kerala faces growing constraints in resource mobilisation that have significant implications on its development trajectory. The fiscal constraints on States restrict the State's capacity to mobilise additional resources commensurate with its development and welfare commitments. These constraints are compounded by challenges arising from the structure and functioning of central transfers. Borrowing limits imposed under the Fiscal Responsibility and Budget Management (FRBM) framework, including the questionable treatment of off-budget borrowings, have constrained fiscal space and reduced the State's ability to spend on infrastructural development and in the social sector. Union Finance Commission transfers have declined as a share of total receipts, and the revenue deficit grants under the first few years of the Fifteenth Finance Commission were stopped well before State finances could stabilise after the serious adverse impact of the Covid-19 pandemic. Centrally Sponsored Schemes limit fiscal autonomy by imposing the Union Government's spending priorities on States with a one-size-fits-all approach in a country where State-wise needs differ vastly. By setting rigid and unsuitable scheme requirements that undermine State-specific priorities (these often include mandatory Central branding), the conditions that come with the Centrally Sponsored Schemes violate the spirit of cooperative federalism. In addition, in many cases, the Union Government has actually withheld fund releases.

Climate-related disasters, including floods, landslides, coastal erosion, extreme rainfall events, and drought, have exposed serious gaps in disaster financing, with central assistance and funding for the State Disaster Risk Management Fund continuing to be inadequate.

Kerala's Committed Expenditure

Salaries, pensions, and interest payments together reflect long-term policy commitments related to public service delivery, social security, and debt servicing. These obligations are central to the State's development path and constitutional responsibilities. These expenditures reflect long-term policy commitments related to public service delivery, social security, and debt servicing.

Over the period from 2015–16 to 2026–27 (BE), expenditure on salaries and pensions increased in nominal terms, in line with the expansion of public services, pay revisions, and growth in the number of pension scheme beneficiaries. Interest payments rose steadily, reflecting higher outstanding debt levels following increased borrowing during the pandemic year. As stated earlier, debts level as a proportion of Gross State Domestic Product has shown a declining trend in the subsequent years.

In the last ten years, committed expenditure, as a share of total revenue expenditure, has remained broadly stable (60 to 65 per cent) (Table 2.3). Expenditure on salaries and pensions together constituted between 41 and 47 per cent of total revenue expenditure in these years. The committed expenditure, including interest payments, was between 59 and 61 per cent of total revenue expenditure, and about 53 to 55 per cent of total expenditure. The spike observed in 2021–22 is attributable to the pandemic-induced reduction in revenue.

Social Security Pensions

The coverage of various pension schemes has expanded over time, ensuring income support to elderly persons, widows, persons with disabilities, and other eligible groups. Pension amounts have been revised at different stages, and additional assistance was announced during periods of disruption, including the Covid-19 pandemic. These interventions have contributed to income stability among vulnerable households and supported consumption at the local level.

Kerala's fiscal policy continues to prioritise inclusive welfare and social protection, reflecting the State's long-standing commitment to human development. The Social Security Pension programme stands as a cornerstone of this approach, ensuring income security and dignity for vulnerable sections of society, including the elderly, widows, persons with disabilities, and agricultural labourers. The pension amount per person has been increased to Rs 1,600 in 2020-21, and Rs 2,000 in 2025-26. The number of beneficiaries has increased to more than 50 lakh individuals in 2025 from 34 lakhs in 2015-16, of which 31 lakh are women. Disbursements have risen from Rs 482 crore in 2016 to Rs 10,760 crore in FY 2024–25, an increase of more than double the allocation over the time period. In addition, the Government also supports pensions through several Welfare Boards. The State Government has announced a new scheme, Sthree Suraksha, for women including transgender woman in the age group of 35 to 60. A total of 31 lakh beneficiaries will be eligible for Rs 1,000 per month.

The consolidation of multiple pension schemes under the Social Security Mission has streamlined administration and improved delivery efficiency

Table 2.3 *Salaries, pension, and interest payments, Kerala, 2015-16 to 2024-25* in Rs crore

Year	Salary	Pension	Interest Payments	Salary + Pension	Salary + Pension + Interest Payments	Salary & Pension (% of TRE)	Salary, Pension & Interest Payments (% of TRE)
2015–16	23,525	13,063	11,111	36,588	47,699	46.5	60.6
2016–17	28,045	15,277	12,117	43,322	55,439	47.6	60.9
2017–18	31,906	19,938	15,120	51,844	66,964	51.9	67.0
2018–19	31,510	19,012	16,748	50,522	67,270	45.8	61.0
2019–20	31,676	19,064	19,215	50,741	69,956	48.5	66.8
2020–21	27,728	18,943	20,975	46,671	67,646	37.8	54.8
2021–22	44,494	26,899	23,303	71,393	94,696	48.8	64.8
2022–23	37,903	26,090	25,176	63,993	89,169	45.1	62.8
2023–24	38,541	25,644	26,986	64,185	91,172	45.0	63.9
2024–25	39,872	27,875	29,138	67,747	96,886	43.4	62.1
2025–26 (RE)	43,854	29,415	31,816	73,574	1,05,084	42.1	60.4
2026-27 (BE)	57,558	38,669	34,376	73,268	1,30,603	44.2	60.0

Source: Finance Department, Government of Kerala
Note: TRE means Total Revenue Expenditure

across Local Self-Governments (LSGs). The use of Direct Benefit Transfer through the State Treasury system has improved efficiency, reduced leakages, and enhanced transparency. The predominance of women among pension beneficiaries, nearly three out every four, highlights gender-inclusiveness. The State has maintained these commitments while keeping expenditure within fiscal responsibility limits, showcasing efficient welfare financing.

The Government of Kerala maintained its commitment to strengthening the public sector by creating an additional 32,000 posts across public services, contributing to capacity enhancement in health, education, and administrative functions. This expansion compliments the State's development strategy, which places public institutions at the centre of service delivery and social provisioning.

In addition to these committed expenditures, a salient feature of the State's fiscal policy is the transfer of funds to LSGs. Decentralised governance in Kerala continues to be supported through regular, predictable, and unconditional transfers, enabling LSGs to play a key role in implementing development and welfare programmes.

Devolution to Local Self-Governments: Kerala's Architecture of Fiscal Decentralisation

Kerala's approach to fiscal decentralisation is grounded in the constitutional mandate for democratic decentralisation and the State's long-standing commitment to participatory development. Unlike most States, Kerala has institutionalised a stable, rule-based, and predictable system of fiscal transfers to Local Self-Governments, enabling them to function as genuine units of local governance rather than just implementing agencies of higher tiers. Transfers to LSGs consist of three components — the General-Purpose Fund, the Maintenance Fund, and the Development Fund — which are formula-based, transparently allocated, and protected from ad-hoc reductions.

LSGs in Kerala implement more than one-third of the State Plan outlay, reflecting the depth of fiscal and functional devolution achieved over successive Plan periods. The Development Fund, linked to the State Plan, supports capital formation, livelihood promotion, and local economic development, while the Maintenance Fund ensures the upkeep of public assets created by LSGs. The General-Purpose Fund provides the flexibility to meet administrative and operational expenditure.

The statutory nature of these transfers has imparted predictability and stability in finances, allowing LSGs to plan, sequence, and implement development projects with greater certainty and continuity. Kerala remains unique in sustaining this statutory framework of fiscal devolution uninterrupted since the Tenth Plan period, thereby reinforcing the institutional foundations of decentralised planning and embedding it firmly within the State's development governance architecture.

The own-source revenues of LSGs increased from Rs 1,230 crore in 2015–16 to Rs 2,933 crore in 2024–25- a compound annual growth rate of 10.14 per cent (Table 2.4). The sharp increase of revenue in 2024–25 reflects policy interventions aimed at improving assessment, coverage, and collection efficiency, particularly in property tax and non-tax revenue streams.

Devolution from State and Union Governments

LSGs in Kerala receive resources through a combination of untied devolution from the State and Union Governments, scheme-based grants, and institutional borrowings. Untied funds are channelled through the Development Fund, Maintenance Fund, and General Purpose Fund. The Development Fund, earmarked for development expenditure, is devolved as a proportion of the State Plan outlay and comprises State funds and Union Finance Commission grants, with approximately 70 per cent contributed by the State Government and 30 per cent by Union grants. Based on the recommendations of the Sixth State Finance Commission, the allocation to the Development Fund is being enhanced annually by 0.5 per cent, with the objective of reaching 30 per cent of the State Plan outlay in a phased manner.

Maintenance Funds, provided for the upkeep of LSG assets, are devolved as a share of the State's Own Tax Revenue (SOTR). From 2021–22, the Maintenance Fund was increased to 6.5 per cent of SOTR, of which 4 per cent is earmarked for road maintenance and 2.5 per cent for non-road maintenance. The General Purpose Fund supports traditional functions and establishment-related expenditure and was enhanced from 3.5 per cent to 4 per cent of SOTR, with effect from 2021–22. Details of the year-wise allocation of funds are presented in Chapter 19.

In addition to untied funds, LSGs receive grants for Centrally Sponsored and State Sponsored Schemes, of which they function largely as implementing agencies responsible for beneficiary identification, site selection, and execution. Major schemes implemented through LSGs include MGNREGS, PMAY (Rural and Urban), the LIFE Housing Scheme, and the Ayyankali Urban Employment Guarantee Scheme, along with certain non-Plan schemes of the State Government.

LSGs are also permitted to raise loans under the Kerala Local Authorities Loan Act, 1963, primarily for housing. Since 2018–19, loans amounting to Rs 5,340 crore have been raised for the LIFE Housing Scheme from HUDCO, with principal repayment by LSGs and interest payment by the State Government.

Despite the multiple funding channels and a robust framework for fiscal devolution, fiscal space at the local level remains constrained. The heavy reliance on devolved funds and scheme-based grants reflects structural limitations rather than weak fiscal effort. Limited own-source revenues, rigid scheme design, and sector-specific borrowing restrict fiscal flexibility, highlighting the need to strengthen local revenues, protect predictable devolution, and enhance autonomy within decentralised governance. The emerging complication of Union Finance Commission local body grants being redistributed based on flawed interpretations of population projections will further affect funds available to LSGs.

The Current State of Central-State Fiscal Relations

Kerala's capacity to finance productive investment is constrained by a structurally imbalanced federal fiscal architecture in which revenue-raising powers are increasingly concentrated at the Union, while States bear the primary responsibility for development expenditure. This imbalance has been reinforced through multiple channels: the centralisation of taxation under the Goods and Services Tax, the withdrawal of assured GST compensation despite the continuation of the compensation cess, restrictive borrowing limits, and a growing share of conditional and discretionary transfers.

The effective share of States in Union tax revenues has been eroded by the expanding use of cesses and surcharges outside the divisible pool, while unconditional Finance Commission transfers have been progressively supplanted by Centrally Sponsored Schemes characterised by rigid design, delays, and partial releases. Although States retain formal rights within the GST framework, institutional and operational constraints have limited the effective exercise of fiscal autonomy.

Together, these developments have weakened the principles of cooperative federalism, reduced fiscal predictability, and narrowed the policy space available to States such as Kerala to sustain public investment alongside their social and developmental commitments.

Table 2.4 *Own-Source Revenues of Gram Panchayats, Municipalities, and Municipal Corporations, 2015-16 to 2024-25* in Rs crore

Sl No	Item	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
I	Tax Revenue										
1	Property Tax	761.2	993.7	1,127.4	1,101.6	1,036.2	1,068.7	1,224.1	1,402.3	1,242.0	1,499.7
2	Profession Tax	160.3	161.6	171.8	185.9	177.9	190.3	224.6	200.8	293.5	471.2
3	Entertainment Tax	83.1	96.1	30.1	8.7	9.2	0.6	3.2	37.3	36.6	53.9
4	Advertisement Tax	4.9	5.3	2.1	0.8	0.4	0.0	0.0	0.3	0.3	-
5	Other taxes	9.5	10.1	4.2	1.4	1.9	0.1	2.5	0.0	21.6	-
	Total: Tax Revenue	1,019.0	1,266.8	1,335.6	1,298.4	1,225.6	1,259.6	1,454.4	1,640.7	1,594.0	2,024.8
II	Non Tax Revenue										
1	Licence Fee	1.5	1.6	1.8	2.4	2.4	2.4	1.0	21.2	26.1	50.7
2	Rent on land & building	105.3	113.4	127.4	133.4	129.5	100.7	100.7	165.7	157.6	181.2
3	Other Non-Tax Revenue	104.4	100.6	139.2	147.5	141.4	137.7	205.2	294.9	582.4	676.6
	Total: Non Tax Revenue	211.3	215.5	268.5	283.2	273.3	240.7	306.9	481.8	766.1	908.5
	Grant Total (I + II)	1,230.3	1,482.3	1,604.1	1,581.6	1,498.9	1,500.3	1,761.3	2,122.6	2,360.2	2,933.3

Source: Information Kerala Mission

The Government of Kerala staged a protest in Delhi, and has approached the Supreme Court seeking its due share of national resources. The Government of Kerala also convened a conclave of finance ministers from like-minded States in 2024. The conclave brought together the finance ministers of Punjab, Tamil Nadu, Telangana, and Karnataka. The objective was to hold broad consultations on the States' memorandum to the Sixteenth Finance Commission, particularly in light of concerns that the divisible pool of taxes has effectively shrunk due to the Union Government's increasing reliance on non-divisible revenue sources such as cesses and surcharges, disinvestment, monetisation of public assets, and RBI profits — where cesses and surcharges rose from 9.4 per cent of gross taxes in 2011–12 to 22.8 per cent in 2022–23 — thereby reducing the effective share of central taxes going into the divisible pool, despite the 41 per cent devolution recommended by the Fifteenth Finance Commission.

The conclave highlighted Kerala's declining share from 3.875 per cent during the tenth Finance Commission to 1.92 per cent under the Fifteenth Finance Commission, attributing this to criteria that disadvantage States with high human development and successful population control. It emphasised the revenue impact of GST — where States surrendered substantial taxation powers without achieving the projected 14 per cent revenue growth, and faced greater shortfalls than the Union — and urged the Sixteenth Finance Commission to account for GST-related losses. Concerns were also raised about Centrally Sponsored Schemes, where States must accept cost-sharing and unilateral conditionalities designed without region-specific considerations, even as some schemes have been discontinued or had the Union's share reduced, increasing the burden on States.

The conclave called for increasing tax devolution to 50 per cent, reducing discretionary grants, and ensuring predictable transfers. It also criticised the continued use of 2011 population data, flagged the Centre's fiscal deficit of 6.4 per cent of GDP while imposing FRBM constraints on States, and emphasised equity and autonomy as the future of Indian federalism.

Recommendations of the Sixteenth Finance Commission

While Kerala's *inter se* share in tax devolution has increased from 1.932 per cent in the Fifteenth Finance Commission award period to 2.382 per cent, the Sixteenth Finance Commission's decision to not recommend post-devolution grants under Article 275 is retrograde.

Despite demands from several States to increase vertical devolution to 50 per cent of the net proceeds of Union taxes to ameliorate the rising vertical fiscal imbalance, the Commission decided to retain the 41 per cent share recommended by the Fifteenth Finance Commission. At a time when the rising shares of surcharges and cesses have been shrinking the divisible pool, the recommendation not to increase States' share will have adverse implications for State finances.

The Sixteenth Finance Commission revised the criteria of *inter se* distribution among States. The changes are shown in Table 2.5.

The Commission has also prescribed uniform fiscal deficit targets for all States, irrespective of differences in per capita income, historical expenditure commitments, revenue capacity, or development needs. Such uniformity does not adequately reflect the diversity in States' fiscal structures and infrastructure requirements.

In its memorandum to the Commission, the Government of Kerala recommended that local body grants be fixed as a proportion of the divisible pool, so that LSGs benefit from the buoyancy of Union tax revenues. It proposed allocating 7.5 per cent of the divisible pool to LSGs as grants, in addition to the demand for 50 per cent vertical devolution to States. The Sixteenth Finance Commission instead has further imposed conditions on local body grants, increasing complexity.

Kerala also sought full central funding of the State Disaster Risk Management Fund and amendments to nationally defined norms to allow greater flexibility in the use of SDRF resources. It also requested specific grants to mitigate vulnerabilities related to coastal erosion, landslides, and extreme rainfall, estimating assistance in addition to full funding of SDRF. Further, it sought State-specific grants to address cost disabilities arising from high population density, limited land availability, a relatively large elderly population, a significant in-migrant labour force, and a high incidence of human-animal interface.

The Sixteenth Finance Commission retained the 75:25 sharing pattern (Union: State for general category States), instead of accepting the demand for full central funding. It has also moved towards a risk-indexed allocation framework for disaster funding rather than discretionary relief. This shift, though technical in design, changes the basis on which disaster assistance is determined and has implications for States with high structural vulnerability.

Table 2.5 *Horizontal devolution criteria under Fifteenth and Sixteenth Finance Commissions* in per cent

Criteria	Fifteenth Finance Commission (2021–26)	Sixteenth Finance Commission (2026–31)
Income Distance	45	42.5
Population (2011)	15	17.5
Demographic Performance	12.5	10
Area	15	10
Forest	10	10
Tax and Fiscal Effort	2.5	—
Contribution to GDP	—	10
Total	100	100

Source: Reports of the Finance Commission

GST Disadvantages Continue

When GST was introduced, it was assumed that the rate of growth of GST revenues would be 14 per cent per annum by 2022. States were eligible for compensation for the loss on account of the introduction of GST for five years from the date of implementation, i.e., July 2017 to July 2022. For factors beyond the control of the State Government, Kerala had not achieved 14 per cent growth even after July 2022. Although the State asked for an extension of the period of compensation, particularly in the light of the fact that the GST compensation cess would continue until 2026, the State's appeals for an extension have been consistently denied.

To illustrate, had the 14 per cent level been achieved, Kerala would have collected Rs 42,091 crores in 2022-23. With the actual collection amounting to only Rs 29,513 crore (2022-23), the State is faced with a shortfall of around Rs 12,578 crore, thus aggravating the stressed fiscal position of the State.

Systemic issues in the Integrated Goods and Services Tax (IGST) settlement mechanism have also cost Kerala. Levied on the interstate supply of goods and services, IGST is collected by the Centre. The accounts are settled periodically and the revenue is shared between the Centre and the States. In July 2024, the Kerala Public Expenditure Review Committee noted that IGST receipts of the State are less than expected, causing loss of revenue for the State.

The recent rationalisation of GST rates approved at the 56th meeting of the GST Council has reduced tax rates on a wide range of goods and services, with significant implications for State revenues. States such as Kerala, with consumption patterns skewed towards higher-taxed commodities expect to experience disproportionately large revenue losses, particularly following the shifting of around 30 items from the 28 per cent slab to the 18 per cent slab. Past experience, such as a similar rate reduction in 2017, indicates substantial revenue shortfalls, with Kerala's compensation claims increasing sharply between 2017–18 and 2020–21. Following the discontinuation of GST compensation, the State's GST revenue growth has lagged behind national trends, and the latest rate rationalisation is projected to result in an additional annual revenue loss of approximately Rs 6,300 crore. It is a matter of record that the Government of Kerala argued that the combined effect of GST design and the cessation of compensation has significantly eroded its fiscal space and had urged the Sixteenth Finance Commission to consider rule-based grants under Article 275 to offset these losses and address the resulting vertical fiscal imbalance.

Capital Expenditure: Commitment to Planning

The Government of Kerala's commitment to further strengthen the planning framework as part of its fiscal and development strategy has not only been reflected in the performance of Kerala's economy, but also in the step up in aggregate public capital expenditure. The abolishment of the Planning Commission also meant the discontinuation of the Plan–Non-Plan distinction that had structured State finances in the country. Following this change, budgetary allocations at the Union level were consolidated, and most States subsequently dissolved their State Planning Boards and adopted a similar budgetary structure. The argument was that the removal of the Plan–Non-Plan distinction would enable a higher share of capital expenditure and reduce the proportion of revenue expenditure in total spending.

Concerns regarding whether this would lead to constraints on capital expenditure growth and an increase in revenue expenditure have been raised repeatedly in policy discourse and are not new.

A recent study by the National Institute of Public Finance and Policy (NIPFP), Delhi, has brought considerable clarity to this issue. Consider the average capital expenditure of 18 major Indian States during the period when Planning Boards were dissolved (that is, the Twelfth Five-Year Plan period; 2012–13 to 2016–17). The share of capital expenditure in total expenditure was 12.8 per cent. But in the subsequent five years from 2017–18 to 2021–22, this share declined to 11.3 per cent. In the following two years (2022–23 and 2023–24), it stood at 12.2 per cent. In short, after the dissolution of Planning Boards, the share of capital expenditure declined across major States.

The same study also underlines Kerala's distinct position. During the Twelfth Five-Year Plan period, the share of capital expenditure in Kerala's budget expenditure was 6.3 per cent. However, in the subsequent five years from 2017–18 to 2021–22, the share of capital expenditure increased to 7.5 per cent, and in the following two years (2022–23 and 2023–24) it further increased to 8.2 per cent.

In other words, by retaining the Planning Board, maintaining the Plan–Non-Plan distinction, and strengthening the planning process, Kerala was able to significantly increase capital expenditure from 2017 onwards. These figures do not include capital investments made through KIIFB since in all-India budgetary accounts, funds provided by the State Government to KIIFB are classified as revenue expenditure. If KIIFB funds are included, capital expenditure in Kerala would be even higher than this study indicates. Another contributing factor has been Kerala's ability, through the planning process, to control unnecessary increases in revenue expenditure and thereby ensure sound financial management.

Kerala Infrastructure Investment Fund Board

The increase in public capital expenditure in Kerala has been supported by supplementing Government resources through investments mobilised by the Kerala Infrastructure Investment Fund Board (KIIFB).

KIIFB was originally established under the Kerala Infrastructure Investment Fund Act, 1999 to facilitate investment in physical infrastructure. Its mandate was substantially expanded through an amendment in 2016, in response to declining fiscal devolution and growing infrastructure requirements. The revised framework enabled the mobilisation of market-based resources and broadened the scope of eligible projects to include both physical and social infrastructure across sectors such as education, health, information technology, industrial estates, transport, tourism, and urban development.

A major reform introduced through the amendment was the restructuring of the financial architecture of the Act. Statutorily assigned revenue streams, including portions of motor vehicle tax and petroleum cess, were earmarked for transfer to KIIFB, eliminating dependence on annual budgetary allocations. These assured and predictable revenue flows were intended to enable securitisation and facilitate the mobilisation of additional capital for immediate infrastructure needs. The amendment also strengthened governance.

These institutional reforms created a robust framework for infrastructure investment despite fiscal constraints. Since 2016, KIIFB has accorded administrative approval to 1,212 projects valued at Rs 96,486.6 crore and has disbursed Rs 34,824 crore.

Exchequer transfers to KIIFB include allocations from Motor Vehicle Tax (MVT), petroleum cess, and additional Government contributions. The MVT transferred to KIIFB increased from Rs 281 crore in 2016–17 to Rs 2,600 crore in 2024–25, with cumulative receipts of Rs 13,871 crore. Petroleum cess transfers ranged from Rs 448 crore in 2016–17 to Rs 530 crore in 2024–25, aggregating to Rs 4,350 crore. Additional Government contributions, provided intermittently, amounted to Rs 1,394 crore. Together, total exchequer transfers rose from Rs 730 crore in 2016–17 to Rs 3,695 crore in 2024–25, with cumulative transfers of Rs 19,615 crore.

In addition to Government transfers, KIIFB has mobilised resources from financial markets. Market borrowings commenced in 2017–18 and increased steadily, peaking at Rs 7,852 crore in 2024–25. Total funds mobilised over the period amounted to Rs 32,472 crore.

Revenue-generating projects have emerged as an additional funding source in recent years. Income from such projects was first recorded in 2019–20 (Rs 484 crore) and rose to Rs 807 crore in 2024–25, with cumulative receipts of Rs 2,036 crore. Annual funds flow — comprising exchequer transfers, net borrowing, and project income — increased from Rs 730 crore in 2016–17 to Rs 10,112 crore in 2024–25, with total inflows of Rs 47,541 crore. Project disbursements increased correspondingly, reaching Rs 6,467 crore in 2024–25 and aggregating to Rs 34,824 crore over the period.

Table 2.6 *Key financial performance indicators of KIIFB, 2016-17 to 2024-25* in Rs crore

Sl no	Particulars	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	TOTAL
1	Share of MVT received	281	621	1,099	1,650	1,634	1,568	2,204	2,214	2,600	13,871
2	Share of petroleum cess received	448	421	502	550	539	500	266	594	530	4,350
3	Additional contribution from Government	-	-	-	-	-	322	-	507	565	1,394
4	TOTAL exchequer transfers (1+2+3)	730	1,043	1,601	2,200	2,173	2,390	2,470	3,314	3,695	19,615
5	Fund mobilised from financial market	-	101	3,006	1,930	670	7,763	6,909	4,242	7,852	32,472
6	Loan repaid	-	-	-	19	76	308	433	3,505	2,242	6,583
7	Interest paid on KIIFB borrowings	-	6	41	401	535	914	1,417	1,835	2,195	7,343
8	Net borrowing (5-6)	-	101	3,006	1,911	594	7,455	6,476	737	5,610	25,890
9	Net borrowing as a multiple of exchequer transfers	-	0.10	1.88	0.87	0.27	3.12	2.62	0.22	1.52	1.32
10	Income received from revenue generating projects	-	-	-	484	-	155	124	467	807	2,036
11	Annual fund flow (4+8+10)	730	1,143	4,606	4,595	2,766	10,000	9,070	4,519	10,112	47,541
12	Project disbursement		443	1,069	3,503	5,485	8,459	4,673	4,725	6,467	34,824

Source: Kerala Infrastructure Investment Fund Board

Table 2.6 presents the key financial performance indicators of KIIFB from 2016–17 to 2024–25.

KIIFB's net borrowing, or the the difference between funds mobilised and loans repaid, reached a cumulative total of Rs 25,889 crore between 2016 and 2025, significantly accelerating infrastructure investment and creating a foundation for future economic growth. Projects with a combined value of Rs 21,881 crore have been completed. Among sectors, road development under the Public Works Department received the largest allocation, with approved projects worth Rs 34,330 crore, of which Rs 10,813 crore has been completed, including Rs 5,580 crore for National Highway land acquisition. Projects worth Rs 6,670 crore in health and Rs 6,995 crore in water resources were also approved.

KIIFB enabled the completion of projects that had remained stalled for decades. Around Rs 6,000 crore was spent on land acquisition for NH 66, facilitating progress on the six-lane corridor. Educational infrastructure was strengthened through funding for 598 school buildings, 45,000 classrooms, and 31 college buildings. In health, KIIFB financed cath labs, dialysis units, and specialised cancer-care facilities, along with Rs 300 crore for land acquisition for the Institute of Advanced Virology. The Rs 1,500-crore K-FON project provides free high-speed internet to poor households and connectivity to Government offices. Other major initiatives include the Wayanad Twin Tunnel, TransGrid 2.0 (including a Rs 152-crore GIS substation at Kuravilangad), the Coastal Highway (Rs 6,500 crore), the Hill Highway (Rs 3,500 crore), and a Rs 350-crore tetrapod seawall at Chellanam.

In June 2025, CRISIL reaffirmed KIIFB's long-term rating at A+(CE)/Negative, one notch above the State rating, supported by credit enhancement mechanisms such as escrow arrangements, Debt Service Reserve Accounts, and liquidity buffers. KIIFB was among the first public sector entities to raise resources through rupee-denominated Masala Bonds.

However, the Union Government's imposition of Net Borrowing Ceiling limits in 2023, by including borrowings of State-owned entities such as KIIFB within the State's borrowing limits, changed KIIFB's operating context. This decision fundamentally altered KIIFB's role as an extra-budgetary resource mobilisation instrument. The retrospective application of this interpretation, albeit through phased instalments, had a direct bearing on State finances and infrastructure investment planning.

The Government of Kerala challenged the imposition of the NBC under Article 293 of the Constitution, contesting the inclusion of KIIFB borrowings within the borrowing limits of the Consolidated Fund of the State. In its order dated 01.04.2024, the Supreme Court directed that the matter be placed before the Hon'ble Chief Justice of India for the constitution of a five-judge Bench to adjudicate the constitutional issues involved. Pending the final judgment of the Constitution Bench, KIIFB borrowings continue to be counted within the overall Net Borrowing Ceiling of the State.

These developments have significantly altered the institutional and fiscal context within which KIIFB was restructured in 2016 and pose new challenges for sustaining extra-budgetary infrastructure financing in the State.

Conclusion

Sound fiscal policy must be judged not merely by the movement of deficit indicators, but by its capacity to secure growth and development in both the short and the long run. Fiscal discipline is meaningful only when it strengthens productive capacity, protects livelihoods, and builds the foundations for sustained economic expansion. A framework that prioritises numerical targets in isolation, without regard to developmental outcomes, risks undermining the very objective that public finance is meant to serve.

The developmental aspirations of a State and its people cannot be constrained by fiscal benchmarks that are detached from ground realities. Public investment in infrastructure, social protection, and human capability formation is not a fiscal excess; it is an economic necessity. Where structural constraints exist, including limitations imposed through central policy decisions, the appropriate response is not retrenchment of development, but to continue to strive to deliver development to its people, all the while fighting for a more just and equitable federal polity.

A democratically elected Government has both the responsibility and the right to determine the most appropriate path to development for its people. This requires predictable and unconditional transfers that respect constitutional principles. The role of the Finance Commission and the Union Government is to foster cooperative fiscal federalism, ensuring equity, autonomy, and transparency in intergovernmental transfers- not to function as political instruments.

Despite sustained pressures on its fiscal autonomy, the Government of Kerala has demonstrated that an alternative path is viable: one that combines social commitment with developmental ambition.

Chapter 3
New Frontiers in School Education in Kerala

Introduction

In the last 10 years, Kerala has stood out among the States of India as one in which public support for Government and Government-aided schools increased substantially and in which, for a substantial period, enrolment in the public sector of schooling increased faster than in the private sector. This period saw significant infrastructural upgrading in terms of school buildings, equipment, and facilities for study and recreation. Public provisioning of textbooks and academic material, provided to school children well in time for the school year, is now the norm, breaking with a period of neglect in respect of these in the immediately preceding years. The revision of textbooks for schools is complete. The importance of this revision cannot be understated. In an India where secular, democratic, and scientific values are under threat, Kerala provides textbooks that attempt to take into account the latest developments in knowledge, that encourage scientific knowledge and the development of a scientific temper, and that seek to encourage the development of democratic, secular, and socially inclusive cultural values.

Vision

Kerala aims to position itself as a global knowledge hub by advancing quality education, ensuring universal access, and strengthening inclusivity, while nurturing lifelong learning, employability, gender equity, and broader social transformation.

Quality education. The Samagra Gunamenma (Comprehensive Quality Education) initiative focuses on providing every student — from pre-school to senior secondary — equitable, inclusive, and high-quality learning experiences. This is pursued through improved infrastructure, enhanced teacher training, updated curricula, and timely delivery of learning materials.

Universal access. Kerala seeks to guarantee equal opportunities for all learners, ensuring that no one is excluded from education on the basis of social, economic, gender, ethnic, or disability-related differences.

Inclusivity. Inclusive education ensures that students of all abilities learn together in age-appropriate classrooms within their own neighbourhood schools, with the support needed to succeed in the core curriculum.

Progress under the 13th and 14th Five-Year Plans

Education has been central to Kerala's social progress, shaping not only development outcomes but also the values of social justice, equality, democracy, and secularism. The State's strong tradition of public intervention in education has been key to advancing these ideals.

The outlay and expenditure on school education have increased over the years, particularly since 2016–17. Expenditures have even exceeded planned outlays in recent years, underscoring efficient financial management, robust implementation capacity, and the high priority placed on school education.

Over the past nine years, the State has also achieved significant improvements in school infrastructure. A total investment of Rs 2,598 crore has been channelled through the Kerala Infrastructure Investment Fund Board (KIIFB) for school infrastructure development. Under this initiative, 973 school buildings were sanctioned across cost categories of Rs 5 crore, Rs 3 crore, and Rs 1 crore, of which 598 have been completed. During this period, all classrooms for Classes 8 to 12 have been upgraded with technology-enabled features, and computer labs were established in Primary schools.

Institutions and Agencies of School Education in Kerala

Table 3.1 *Plan expenditure on school education, Kerala, 2016-17 to 2024-25* in Rs lakh

Year	Expenditure
2016-17	75,206.4
2017-18	75,081.9
2018-19	66,425.5
2019-20	48,740.3
2020-21	74,601.3
2021-22	88,649.5
2022-23	1,02,682.4
2023-24	1,11,527.3
2024-25	1,10,955.3
Total	7,53,869.9

Source: Budget documents, various years

Directorate of General Education (DGE). The Directorate of General Education (DGE) oversees all school education activities in Kerala. During the 13th Plan period, following a recommendation by an expert committee led by Prof. M.A. Khader, the Government merged the three previously separate directorates- the Directorate of Public Instruction, the Directorate of Higher Secondary Education, and the Directorate of Vocational Higher Secondary Education into the single DGE. Under the DGE's stewardship, programmes such as educational support services, the Mid-Day Meal Programme, and school infrastructure development have been formulated and implemented. The DGE has also launched a comprehensive Teacher Transformation Programme for Higher Secondary School Teachers, serving as a pilot model for future in-service teacher training initiatives.

State Council of Educational Research and Training (SCERT). The State Council of Educational Research and Training, Kerala (SCERT Kerala) is an autonomous academic body under the General Education Department, Government of Kerala, responsible for planning, implementing and evaluating academic programmes from the pre-school to higher secondary level education. SCERT Kerala serves as the State-level academic authority: it develops curricula, prepares textbooks and teachers' hand-books, coordinates in-service teacher training, and advises the Government on policy matters pertaining to school education.

Samagra Shiksha, Kerala (SSK). SSK is an integrated scheme on school education that envisages the school as a continuum from Pre-School to Higher Secondary levels. The creation of such a single administrative structure assists in developing a school sector-wide strategy, stressing improvement in the quality of education. The common objectives of the scheme are: enhancing access through the expansion of quality school education; promoting equity through the inclusion of under-privileged groups and weaker sections; improving the quality of education for all; bridging social and gender gaps in school education; ensuring equity and inclusion at all levels of school education and promoting the vocationalisation of education. All the activities by SSK have been undertaken in order to achieve the broader objectives of Pothuvidyabhyasa Samrakshana Yajnam (Public Education Rejuvenation Campaign), and to bridge academic lacunae to ensure age-appropriate education as envisaged in the Right to Education Act.

State Institute of Educational Management and Training (SIEMAT)-Kerala. SIEMAT-Kerala has been contributing in various ways to impart management training for leaders in the educational sector including to the heads of the institutions, educational officers, parents, Local Self-Government (LSG) members, administrative staff, and special school functionaries. One of the major objectives of the training programme is to provide training to teachers in classroom management in order to create a child-friendly environment in schools.

Kerala Infrastructure and Technology for Education (KITE). KITE is a State-owned enterprise of the Government of Kerala, registered as a Section 8 Company, which evolved from the earlier IT@School project. It serves as the major implementing agency for Information and Communication Technology (ICT)-enabled programmes in school education across the State. Through large investments, KITE has enabled technology-friendly classrooms and labs in all schools, equipping them with ICT gadgets, high-speed broadband connectivity, digital resource portals, and trained teachers. With a firm commitment to Free and Open Source Software (FOSS), KITE has also brought in world-class educational software and its own customised Operating System for schools.

State Institute for the Mentally Challenged (SIMC). The State Institute for the Mentally Challenged (SIMC) serves as Kerala's nodal institute for special education, training, and rehabilitation of individuals with intellectual disabilities. SIMC provides a wide range of services, including a special school, clinical and physiotherapy services, early intervention and vocational training centres, and hostel facilities. It also conducts professional courses such as Diploma in Education-Special Education (Mental Retardation), Diploma in Education (Special Education in Autism Spectrum Disorders), and Diploma in Vocational Rehabilitation, along with parental training programmes across the State.

Kerala State Literacy Mission Authority (KSLMA). The KSLMA implements a wide range of innovative literacy and continuing-education programmes. The Mission has launched social literacy initiatives covering areas such as health, environment, gender, the Kerala renaissance, the Constitution of India, and e-learning. It runs focused and specialised programmes for marginalised groups including Scheduled Castes (SC), Scheduled Tribes (ST), migrant workers, and

transgender persons. Additionally, KSLMA conducts formal schooling equivalency programmes.

School Education Reforms

Between 2017 and 2025, Kerala's school education reforms have centred on the three pillars of Rejuvenation, Resilience, and Recognition. The following sections outline the State's progress in each of these areas.

I. Rejuvenation

Recognising the evolving demands of modern education, the 13th and 14th Five-Year Plan identified school education as a major focus for State intervention. Funds were allocated to strengthen the Education Mission's Pothu Vidyabhyasa Samrakshana Yajnam (Public Education Rejuvenation Campaign), aimed at updating classrooms, curricula, and overall learning environments.

A State-level Mission chaired by the Chief Minister and supported by the Secretary of General Education as Mission Secretary was established to coordinate activities under the campaign. At a time when public school enrolment was declining, the initiative brought together teachers, parents, alumni, and elected representatives, encouraging a people's campaign approach.

This campaign has helped revitalise the school education system through measures designed to deliver universal, high-quality, holistic, and modern education, following the principles of universal access to education; enhanced quality of public-school education; holistic student development initiatives; schools as a support ecosystem; in-tune with the times; inclusive, equitable and need-based literacy building; and other school education rejuvenation programmes.

i. Universal access to education Number of schools. In 2024-25, Kerala had 12,945 schools from Lower Primary to High School levels, with aided schools forming the majority (55.6 per cent).

The State has 2,076 Higher Secondary Schools (HSS) with 7,223 batches. To improve access to Higher Secondary education, the number of seats was increased by 30 per cent in Government HSS in all Districts, 20–30 per cent in aided schools in Palakkad, Kozhikode, Thiruvananthapuram, Malappuram, Wayanad, Kannur, and Kasaragod, and by 20 per cent in aided schools in Kollam, Ernakulam, and Thrissur.

Early Childhood Care and Education (ECCE) in Kerala begins with Pre-School education. The General Education Department operates 53 Pre-Schools with teachers appointed through the Kerala Public Service Commission. Pre-Primary classes in 2,182 Government schools are managed by Parent-Teacher Associations. Most Government-approved Pre-Schools use the children's home languages such as Malayalam, Kannada, or Tamil, as the medium of instruction and follow the SCERT curriculum, including Kalippattam (activity book) and Kalithoni (worksheets).

In addition to State syllabus schools, Kerala also hosts a substantial number of institutions affiliated with other Boards. In 2024-25, there were 1,593 such schools, including 1,371 CBSE schools, 168 ICSE schools, 40 Kendriya Vidyalayas, and 14 Jawahar Navodaya Vidyalayas.

Universal enrolment. Kerala's public education system experienced a strong revival through the Pothuvidyabhyasa Samrakshana Yajnam under the Nava Kerala Karmapadhati. Between 2018-19 and 2025-26, Government and aided schools showed an increase of 7,15,508 new students, including 24,396 fresh admissions in 2025-26 alone (Classes 1–10). Girls accounted for 49.1 per cent of total enrolment.

Among Scheduled Caste (SC) and Scheduled Tribe (ST) students, only a small proportion attend private unaided schools, i.e. 3.4 per cent of SC and 0.5 per cent of ST students. A majority of ST students (58.4 per cent) study in Government schools. According to the UDISE+ 2024-25 Report of the Ministry of Education, Government of India, Kerala's Net Enrolment Ratio (NER) at the Primary (83.2), Upper Primary (81.6), Secondary (71.5), and Higher Secondary (64.2) levels exceeds the national average.

Having achieved universal and free elementary education, the State aims to extend universal education up to Class 12.

High retention rates. Retention rate is the percentage of students from a cohort who remain in the educational system until a given educational cycle is completed; this is a positive indicator where higher values indicate better student persistence. Kerala has high retention rates across gender and level of education (Table 3.2).

Low dropout rates. Kerala has made significant strides in reducing student dropout rates. The State achieved zero per cent dropout rates in preparatory and middle schools. The dropout ratio among SC students in Kerala in 2023-24 was 0.06 and that of ST students was 0.67. The total dropout ratio was highest in Wayanad District (0.4 per cent) followed by Idukki (0.3 per cent) in 2023-24.

Inclusive school education. The Right to Education Act of 2009 has broadened the scope of inclusive education, which was previously limited to children with physical and intellectual challenges. The Government

of Kerala promotes access to and the opportunity for education to all children who are excluded from formal education or are neglected within the system. With the scope for peer-coaching, inclusive education also facilitates better relations among children.

Special education. In 2024-25, 45 special schools run by the Directorate of General Education enrolled a total of 2,805 students. In addition, 344 special schools operate under NGOs, LSGs, and the Deendayal Disabled Rehabilitation Scheme (DDRS). A total of 58,929 students with disabilities were enrolled, across Government, aided, and unaided schools, comprising 35,197 boys and 23,732 girls. Malappuram, Kozhikode, and Palakkad recorded the highest numbers of students under the IED (Inclusive Education for Disabled) category.

The Government provides annual financial assistance to these schools to support travel, hostels, and mentoring; in 2025-26, Rs 1.6 crore has been allocated. Students also receive free uniforms, mid-day meals, travel and hostel allowances, and excursion support. Additional initiatives include barrier-free campuses, assistive devices, and services from resource teachers and centres to promote inclusive education.

Programmes under Samagra Siksha Kerala (SSK). Samagra Shiksha Kerala (SSK), a comprehensive programme covering Pre-School to Class 12, implements a range of initiatives to promote inclusive education for students with disabilities.

The Changathikoottam (friends' group) project, launched in 2018–19, focused on improving learning and socialisation for bedridden children. Building on this, Resource Bedrooms and virtual classrooms were introduced to meet the specific needs of children and their families. The importance of Autism Centres has grown alongside the increasing number of children diagnosed with Autism. Currently, SSK supports 50 Autism Centres across Kerala, staffed with specially trained teachers, serving over 2,435 students.

Additional services under SSK include medical camps, therapeutic support, training and empowerment of resource teachers, distribution of assistive aids, development of innovative teaching-learning methods, reader allowances, stipends for girls, and parent empowerment initiatives.

Schemes by the Social Justice Department. The Social Justice Department of the Government of Kerala implements several schemes that support inclusive education for students with disabilities. Vidyakiranam provides educational assistance to children from economically disadvantaged families where one or both parents have disabilities. The Vidyajyothi scheme offers financial support for the purchase of uniforms and study material. In addition, students with disabilities who have dropped out receive assistance to pursue SSLC, Class 11, and Class 12 equivalency courses offered by the Kerala State Literacy Mission.

Equivalency programmes. Equivalency programmes are designed to offer educational opportunities comparable to the formal school system.

Individuals who complete the 4th Standard equivalency and those who previously dropped out at the Upper Primary level can enrol in the 7th Standard equivalency programme. A total of 885 learners benefited from the 4th Standard course (18th batch). For the 7th Standard programme, the 17th batch (2024) enrolled 1,604 learners, of whom 1,043 appeared for the examination, and 1,007 qualified for higher studies.

The Kerala State Literacy Mission Authority is making efforts to bring a large number of persons back to their studies and to enrol them in 10th and Higher Secondary equivalency courses**.** In 2024, 16,599 benefitted from 10th Standard Equivalency courses. Of these, 15.8 per cent beneficiaries were from Scheduled Castes, 2.7 per cent from Scheduled Tribes, and 2.4

Table 3.2 *Retention rate by level of education and gender, Kerala, and India, 2023-24* in per cent

	Primary (1 to 5)			Elementary (1 to 8)			Secondary (1 to 10)			Higher Secondary (1 to 12)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
India	85.1	85.7	85.4	77.3	78.9	78	63.1	64.6	63.8	43.8	47.5	45.6
Kerala	94.9	95.5	95.2	96.7	97.9	97.3	98.4	98.8	98.6	87.7	93.1	90.4

Source: Ministry of Education, Government of India, 2024

per cent were people with disabilities. In the same year, 21,345 benefitted from Higher Secondary equivalency, of which 17.1 per cent were from SC, 2.8 per cent from ST, and 1.6 per cent were people with disabilities.

Continuing education programme for transgender persons. Kerala was the first State in India to implement a transgender policy in 2015, and since then it has undertaken focused efforts to promote the education of transgender persons.

High dropout rates remain a major challenge for the transgender community, driven by social discrimination, financial hardship, and limited family support. To address this, the Kerala State Literacy Mission Authority (KSLMA), in collaboration with the Social Justice Department, launched Samanwaya, a continuing education programme for transgender learners. Through this initiative, KSLMA surveyed and identified 918 transgender persons, of whom 145 have registered for Class 4, 7, 10, and Higher Secondary equivalency courses.

Transgender learners across the State can also enrol in the Mission's Class 10 and Higher Secondary equivalency courses through Padanaveedu, a dedicated residential facility. In addition to accommodation, each student receives a monthly scholarship of Rs 1,200 under the scheme.

Because of the special efforts of KSLMA in the last few years to include transgender persons in the programmes, a total number of 101 have benefitted from the 10th and Higher Secondary equivalency programmes in 2023 and 2024.

ii. Enhanced quality of public school education

Enhanced quality in public school education is reflected in improvements to physical infrastructure, strengthened teacher training, updated curricula, and timely textbook delivery- all supported by steady and increasing financial outlays and expenditure.

A clear sign of the quality of school education is the pass percentage, and grades of students-especially in the 10th and 12th Standards. Table 3.3 shows that Kerala's performance has consistently been high.

Table 3.3 *Pass Percentage in Kerala schools, 2017-18 to 2024-25*

Year	Class 10	Class 12
2017-18	97.8	83.8
2018-19	98.1	84.3
2019-20	98.8	85.1
2020-21	99.5	87.9
2021-22	99.3	83.8
2022-23	99.7	82.9
2023-24	99.7	78.7
2024-25	99.5	75.3

Source: Directorate of General Education, 2025

Physical infrastructure development. Most Government schools in Kerala in 2024-25 operated from *pucca* buildings, with only 114 functioning in rented facilities. Nearly all Government schools (99.1 per cent) had access to drinking water, and all were equipped with urinal and latrine facilities.

Teacher training. In 2024-25, Kerala had 1,55,447 school teachers, of whom 87,668 (56.4 per cent) worked in aided schools, 12,959 (8.3 per cent) in private unaided schools, and 54,820 (35.3 per cent) in Government schools. Half of all teachers (50.2 per cent) taught at the High School level, while 25.6 per cent were in upper primary and 24.2 per cent in Lower Primary schools. Women constituted 76 per cent of the teaching workforce.

To ensure quality education, the State conducts regular teacher empowerment programmes. Continuous training is offered from the Primary to Higher Secondary levels, including vacation programmes that provide opportunities for cluster training, orientation for newly inducted teachers, IT training, and learning enrichment programmes.

Teachers receive training in various courses through the KITE's Open Online Learning (KOOL) platform.

Curriculum revision. The Government of Kerala launched a comprehensive revision of the school curriculum in 2022, the first major update since the 2007 Curriculum Framework. The State Council of Educational Research and Training (SCERT) led the process by establishing a State Curriculum Steering Committee, Core Committee, and 26 Focus Groups. Drawing on position papers and extensive stakeholder consultations, SCERT developed the Kerala Curriculum Framework (KCF 2023) for pre-school, school, teacher, and adult education.

Following KCF 2023, revised textbooks were introduced for Classes 1, 3, 5, 7, and 9 in 2024–25, and for Classes 2, 4, 6, 8, and 10 in 2025–26. A total of 410 titles were produced in Malayalam, English, Tamil, and Kannada. New activity books for Art Education, Health and Physical Education, and Work

Integrated Education were also introduced for Classes 5 to 10, along with teacher and parent support materials. SCERT completed a gender audit of textbooks, and also developed a separate curriculum for sports schools. Textbook development followed an eight-stage process including concept mapping, writing, editing, expert review, and final approval by the Curriculum Steering Committee.

Curriculum for Work and Art Education. Greater emphasis has been placed on integrating work and art education into the curriculum. SCERT developed dedicated curricula, prepared training modules for teachers, and created activity books to support students' learning in these areas.

Timely textbook availability and digitised textbooks. In addition to ensuring the timely distribution of printed textbooks, the Government of Kerala has made digital versions of all textbooks easily accessible. Textbooks for Classes 1–10 and Higher Secondary (Classes 11 and 12) can be downloaded in PDF format by teachers and students. These resources are available on Samagra, the online learning platform developed by KITE, which supports digital learning and resource-sharing across the State.

iii. Holistic student development initiatives

Kerala's education system prioritises holistic student development through programmes that strengthen health, nutrition, discipline, creativity, leadership, physical fitness, and social responsibility.

The Mid-day Meal Scheme, introduced in 1984 and later integrated with the national programme, provides nutritious meals that improve students' health, attendance, and social equity. Kerala pioneered the Mid-Day Meal Programme in India, establishing a vital precedent for school-based social safety nets. By targeting the nutritional needs of children aged 6 to 14, the initiative has become a cornerstone of the State's educational success. It effectively mitigates barriers to education for economically and socially marginalised communities, ensuring that food insecurity does not interrupt a child's right to learn. This programme remains a primary driver behind Kerala's high retention rates and universal access to education. Nearly 25 lakh children benefit from the scheme. Initiatives such as the National Cadet Corps (NCC), National Service Scheme (NSS), and Student Police Cadet (SPC) Project build discipline, leadership, and civic responsibility through community service and experiential learning.

Cultural and sports events including the Kerala School Kalolsavam, Special School Kalolsavam, and Kerala School Sports and Games promote artistic expression, inclusivity, and physical fitness. Awareness activities under the Vimukthi Mission address substance abuse, while the Kerala State School Sasthrolsavam nurtures scientific curiosity and innovation.

In addition, school clubs such as Nature, Science, and Souhruda foster environmental awareness and social values, and the observance of national days reinforces patriotism and civic consciousness among students.

iv. Schools as a support ecosystem

Schools serve not only as centres for academic learning but also as holistic support systems that nurture children's social and emotional growth. They build camaraderie, friendship, teamwork, and interpersonal bonding, shaping students into well-rounded individuals prepared for both personal and community life.

Parent-Teachers Associations (PTAs). PTAs act as collaborative platforms where parents and teachers work together to ensure the welfare of students and the school community. They contribute to improving facilities, maintaining discipline, and supporting both academic and administrative functions. Their primary aim is to enhance the overall educational environment and promote student well-being.

School-based counselling for students. In Kerala, the Psycho-Social Support programme, jointly implemented by the Women and Child Development Department and the Department of Education, provides psychosocial counselling for school children. Counsellors play therapeutic, preventive, and developmental roles by addressing personal and psychological issues, fostering life skills, and creating a positive school climate. The programme focuses on early intervention to promote mental health. Additional funds have been allocated in the 2025-26 budget to expand the programme to more schools.

Learning on disaster management. After the 2018 floods, which severely impacted Kerala's schools, the Kerala State Disaster Management Authority (KSDMA) and United Nations Development Programme (UNDP) launched the School Safety Programme to train teachers, students, and staff on disaster preparedness, conduct mock drills, and develop school safety plans. Learning material was also available in sign language and braille, ensuring inclusivity.

Menstrual Hygiene Management (MHM). To support adolescent girls, an MHM initiative under the SHE-PAD Project has been implemented by the Kerala State Women's Development Corporation in partnership with HLL Lifecare Ltd. The programme provides free

sanitary napkins, storage facilities, and incinerators, along with awareness sessions on menstrual health. It aims is to promote hygienic practices, build confidence, reduce absenteeism, and challenge social taboos surrounding menstruation, thereby empowering girls and improving their participation in school.

v. IT-enabled education and KITE

Kerala has extensively integrated Information and Communication Technology (ICT) in school education to prepare students for higher education and diverse career paths. ICT-enabled learning in the State encourages students to be active creators of knowledge rather than passive recipients. Teachers at Primary, Secondary, and Higher Secondary levels regularly use digital tools to enhance learning, with Free and Open-Source Software (FOSS) enabling flexible content development.

Kerala Infrastructure and Technology for Education (KITE), a State Government enterprise, has modernised schools over the past decade through ICT integration, capacity building, content development, connectivity, e-learning, satellite-based education, e-governance, technical support, and infrastructure upgrades. With high-speed broadband, digital resource portals, trained teachers, and ICT devices, Kerala now has a comprehensive ICT-enabled ecosystem. From digital classrooms to AI-driven learning systems, KITE's interventions have positioned Kerala as a national leader in digital education. Major ICT initiatives include:

Hi-Tech School and Lab Projects. The Rs 493.5 crore Hi-Tech School Project and the Rs 300 crore Hi-Tech Lab Project upgraded over 15,000 schools. About 45,000 classrooms in 4,752 Secondary schools received laptops, projectors, USB speakers, webcams, printers, and broadband, while 11,257 Primary and Upper Primary schools were equipped with ICT devices, totalling 1.4 lakh devices State-wide. These initiatives have enabled digital teaching, access to the SAMAGRA portal, and equitable technology access across Kerala.

ICT textbooks. Kerala is the first State in India to introduce ICT as a compulsory subject with textbooks for Classes 1–10. The Kalipetty series (Classes 1–4) promotes learning through play, combining language, mathematics, and environmental studies. The e-Vidya series (Classes 8–12) emphasises computational thinking, digital citizenship, programming, and media literacy. Developed with FOSS, all books offer practical activities, and are available in Malayalam, English, Tamil, and Kannada via the Samagra portal.

Little KITEs IT Clubs. Active in 2,100 schools with 1.9 lakh members, Little KITEs is India's largest student ICT network. The Clubs foster creativity, teamwork, and responsible digital behaviour through robotics, animation, AI, app development, cyber safety, and electronics. In 2024, UNICEF recognised Little KITEs as a global model. Clubs conducted peer training, competitions, and community outreach, training 4 lakh parents and 21 lakh students in digital safety and media literacy in 2023–24.

Samagra Plus. Kerala's official digital learning management platform hosts over 56,000 resources for Classes 1–12, reaching 43 lakh students and 2 lakh teachers, and supports classroom instruction, self-learning, and continuous evaluation. It offers lesson plans aligned with SCERT curricula via Learning Room, and micro-plans, evaluation tools, question banks, interactive activities, parent interfaces, and accessibility features. (www.samagra.kite.kerala.gov.in)

KOOL – KITE's Open Online Learning. Following the MOOC model, KOOL (Kerala Online Open Learning for Teachers) upskills teachers in digital pedagogy, ICT tools, and educational innovation. Over 54,000 teachers have completed courses, with mentor-based structures, video tutorials, and flexible learning options.

E-Cube (E3) Language Lab programme. Activity-based language labs for Classes 1–7 (English and Hindi) support storytelling, phonetics, and interactive learning. The E3 English Lab (launched in 2022) and Hindi Lab, Prayogshaala, (introduced in 2024) include storytelling, phonetic exercises, and interactive games across progressive levels.

Sahitham mentoring portal. The portal provides a digital mentoring framework that helps teachers track students' academic and socio-emotional growth. It allows cognitive progress, social awareness, and learning gaps to be recorded, helping teachers plan personalised interventions. The initiative represents a shift from rote assessment to formative, empathy-based mentoring.

VICTERS channel. KITE-VICTERS (www.victers.kite.kerala.gov.in) is India's first educational TV channel. The curriculum-aligned and skill-oriented content for students, teachers, and parents has over 3 million YouTube subscribers and 27 TB of daily data downloads. Popular programmes include Haritha Vidyalayam, Mind It, Neutral Accent, Art Box, and E-Cube Stories.

FOSS-based Operating System– KITE GNU/Linux
This customised Ubuntu-based operating system is used in over 2 lakh school computers. The OS includes

a comprehensive suite of educational software such as GeoGebra, PhET, LibreOffice, Scratch, Krita, and AI-related applications. It also supports Malayalam computing and offers tools for 3D animation, programming, video editing, and digital publishing. A dedicated team of teachers manage updates and security patches.

School Wiki. This collaborative learning platform (www.schoolwiki.in) connects over 16,000 schools, and has about 2 lakh articles, 82,000 users, and 29 lakh updates. It is the largest school-level digital repository in Indian regional languages. Each school maintains its own page featuring data, achievements, alumni profiles, class magazines, and creative works.

e-Waste management in schools. KITE, in association with Clean Kerala Company, has safely disposed over 750 tonnes of e-waste from schools. Detailed circulars guide schools on safe segregation and disposal processes.

Robotics and AI education. In 2024–25, KITE distributed 29,000 Arduino-based robotics kits to schools, introducing robotics education in Class 10 for 4.30 lakh students. These kits enable students to prototype electronic projects such as traffic signals, automated lighting, and home automation systems, nurturing creativity and scientific thinking.

KITE also launched AI training for 80,000 teachers, the first initiative of its kind in India, covering AI tools, prompt engineering, data visualisation, and ethical use. AI concepts were incorporated into the Class 7 ICT curriculum, making Kerala the first State to provide structured AI education to all students. The Samagra Plus AI platform integrates AI into classroom teaching, offering personalised learning, automated assessments, and tailored resource recommendations. Additionally, the public AI Essentials course has trained 1,660 learners in foundational AI concepts.

AVGC curriculum integration. In 2025, KITE introduced innovative curriculum in Animation, Visual Effects, Gaming, and Comics (AVGC) at the secondary level. The AVGC module promotes creative expression, digital storytelling, and employable skills in multimedia production. Students learn 2D/3D animation, basic game design, and visual communication using FOSS tools such as Blender and Synfig. Integrated with Little KITEs activities, the AVGC curriculum encourages project-based learning and bridges academic knowledge with emerging creative industries.

II. Resilience

The period from 2017 to 2025 will be remembered in the history of Kerala's school education as a time of resilience, marked by overcoming significant challenges, including the devastating floods in 2018 and the Covid-19 pandemic.

i. Floods of 2018. Between June and August 2018, Kerala experienced the most severe floods since 1924. A total of 1,613 schools were affected, along with damage to 1,148 toilets, 842 urinals, and approximately 34,251 metres of compound walls. School mid-day meals were disrupted due to the loss of kitchen infrastructure and utensils. The hardest-hit Districts were Alappuzha, Ernakulam, Pathanamthitta, Thrissur, Wayanad, Idukki, and Kottayam.

Immediately after the floods, detailed instructions were issued for clearing debris and cleaning schools. Nearly all schools reopened on August 29, 2018, within ten days of the floods. Teachers and Education Department officials actively participated in school restoration and also volunteered in relief camps.

ii. Covid-19. The Covid-19 pandemic brought social life to a near standstill and restricted the mobility of people. Children were compelled to adapt to this unprecedented environment, which affected their learning, emotional well-being, and social development. Prolonged confinement was particularly challenging, limiting opportunities for learning, social interaction, new experiences, and creative activities. In response, the Education Department had to proactively develop new initiatives to address the challenges posed by the pandemic. These included:

Digital Learning. The Government of Kerala launched a digital class programme called First Bell, broadcast through the VICTERS Educational Channel. SCERT provided academic support, while KITE managed the technical coordination. Samagra Shiksha Kerala (SSK) and SIET were also involved in the programme.

White Board and eVidyalayam. To support children with special needs, Samagra Shiksha Kerala developed dedicated content under the project White Board, which was uploaded on YouTube. To cater to Tamil and Kannada medium students, digital classes were prepared by KITE with academic support from District Institute of Education and Training (DIET), broadcast on local channels, and uploaded on YouTube. Additionally, digital classes for vocational subjects were made available through the VHSE eVidyalayam YouTube channel.

Akshara Vriksham (The Tree of Letters). Creative content, including stories, poems, and articles prepared by students during the lockdown, was collected, compiled, and published on KITE's online portal. Over 50,000 entries were received from across the

Table 3.4 *Key indicators of UDISE+, Kerala and India, 2023-24*

Indicator	Kerala	National Average
Gross Enrolment Ratio	95.4	89.7
Dropout Rate (Preparatory Level)	0	3.7
Dropout Rate (Middle Level)	0	5.2
Dropout Rate (Secondary Level)	2.18	10.9
Pupil-Teacher Ratio (Secondary)	16	21
Schools with Computers	99.1	57.2
Internet Connectivity in Schools	92.1	53.9
Gender Parity Index	>1	~1

Source: Ministry of Education

State. SCERT Kerala selected the best content for publication. This initiative was recognised in the India Book of Records.

III. Recognition

Kerala is placed favourably high across a wide range of indicators of school education such as those monitored as part of UDISE+ (Unified District Infomation System for Education Plus) (Table 3.4).

Kerala leads in the School Education Quality Index (SEQI) prepared by NITI Aayog and consistently secures the top layer in the Performance Grade Index (PGI) of the Ministry of Education. The State's overall performance has improved in the PARAKH Rashtriya Sarvekshan 2024 report. As per the report, Kerala is second among 29 States and 7 Union Territories. Kerala has been declared the first digital State in India for school education: all activities (classrooms, teacher training, academic operations, admissions, transfers, governance) are digitally enabled; all classrooms in Government/aided schools for classes 8–12 are technology-friendly; digital labs are set up in all primary and upper-primary schools. The universal participation of children in formal schooling up to age 17 is an outstanding achievement in Kerala, overcoming traditional barriers (gender, caste, income, geography), and ensuring that even rural populations have access to Secondary schools within reasonable reach. A study by UNICEF terms the Little KITEs IT Clubs a global model in education.

Way Forward

Kerala has achieved major progress in school education. The task ahead is to ensure continuous improvement across different aspects of education by learning from best practices and setting benchmarks for modern learning facilities and education quality.

The State has built a strong foundation in school education by ensuring wide access, democratic governance, and improved quality indicators. Kerala continues to face challenges despite these strengths. The School Education Quality Index framework highlights that quality education depends not only on enrolment but also on learning outcomes, infrastructure, and equitable opportunities for all children. Changes in the State's demographic structure must also be considered. Kerala performs well on many measures, but continued innovation in pedagogy, digital readiness, and inclusive education is necessary to sustain and strengthen its role as a model of modern, democratic, secular, and scientific school education.

Chapter 4
Higher and Technical Education

Introduction

From 2016 through 2026, the Government of Kerala has undertaken a multi-pronged policy with respect to higher education. It invested Plan funds and funds from KIIFB in building infrastructure. It invested in equipment, other infrastructure requirements, and, importantly, in teacher training. In 2021, it appointed high-level committees of experts to advise the Government on academics and academic administration, on evaluation and examinations, and on governance in the higher education sector. The growth of Plan investments in the higher education sector have consistently been above the average for the Plan as a whole. The effect of recent policy interventions can be seen in a significant improvement in the position of institutions of higher learning in Kerala in all-India rankings.

The NITI Aayog report titled Expanding Quality Higher Education through States and State Public Universities (2025) notes that Kerala remains among the highest spenders on higher education per youth. Kerala allocates 3.5 per cent of its Gross State Domestic Product to education, with 0.5 per cent directed towards higher education. The Gross Enrolment Ratio (GER) in Kerala is 41.3 per cent, which is significantly higher than the national average of 28.4 per cent. Kerala also has the highest Gender Parity Index in the country at 1.44, well above the national value of 1.01.

Linking higher education with economic transformation and employment is a challenge that is now being met with the utmost seriousness. Among the most serious challenges to higher education today come from the new attempts by the Union Government and reactionary forces to take over university administration, posing a risk to Kerala's vision of a higher education system that is secular, democratic, discussion oriented, and guided by scientific temper.

Commissions for Excellence in Higher Education

To address emerging challenges and capitalise on new opportunities, and as a suitable alternative to the regressive requirements of national policies, the Government of Kerala sought to identify and assess the constraints that have adversely affected current systems, and formulate concrete recommendations to develop a strategic plan for sectoral reform. The Government appointed three Commissions to examine various aspects of higher education in the State and formulate concrete recommendations to develop a strategic plan for reforming the sector.

The Commission for Reforms in Higher Education, chaired by Dr. Shyam B. Menon, examined important aspects of the existing system of higher education in the State, particularly the larger objectives of transforming the State into a knowledge society and developing a knowledge economy. The Commission for Reforms in Examination in the Universities and Higher Education Institutions of Kerala, chaired by Dr. C.T. Aravindakumar reviewed the current state of examinations in universities and higher education institutions in Kerala and proposed substantial reforms to the examination system and its processes. The Commission for Kerala State University Law Reforms, chaired by Dr. N K Jayakumar, examined the laws, statutes, regulations, and ordinances of universities, particularly in the context of the regulations of the UGC, AICTE, and NCTE, and formulated proposals for revising them to transform the State into a knowledge society. The Commissions individually examined the status quo and proposed fundamental and far-reaching changes to the State's system of higher education. An implementation cell has been established within the Government to examine and implement the recommendations of the Commissions on a priority basis.

The Commissions have suggested a slew of measures to be implemented in the short, medium, and long terms. The general recommendations include substantial investment in the higher education sector to enhance the GER to 75 per cent. The Commissions observed that increased GER cannot be achieved only through Government investment. The Commissions noted that the role and importance of public investment in higher education cannot be overstated, given the non-rival nature of knowledge (a public good) and the substantial positive externalities it generates. The source of funding (public investment or private investment) has a significant impact on the question of equity with respect to access and outcomes in higher education. Although public investment is crucial in determining the development of growth capability and, ultimately, the economy's growth potential, given the distributional consequences of the benefits generated, universities and other higher education institutes should also explore the possibility of mobilising private philanthropic funds,

CSR funds, alumni contributions, private donations, and endowments, in order to augment public investment in higher education. The Commissions recommended that the Government explore new financial sources for the higher education sector, with an institutional arrangement to ensure social control over the financing of higher education. Other major recommendations include the establishment of Centres of Excellence and mechanisms for inter-institutional linkage, as well as an active relationship with industry.

The Commissions have recommended drastic changes in the administrative systems of higher education institutions, including the restructuring of governance systems, such as the structure and functions of the senate and the syndicate, the conduct of examinations, and the development of syllabi and curricula, which would require a thorough review of the Acts and statutes of the universities.

The Government has made concerted efforts to implement the key recommendations of the Commissions in a time-bound manner, prioritising relatively plausible and short-term measures first, and medium- and long-term recommendations later.

Growth of the Higher Education Sector in Kerala

The higher education system in Kerala has undergone drastic transformation since the State's formation. The establishment of Government arts and science colleges across the State, along with the growth of aided institutions, redefined the State's higher education landscape. The most significant change has been the increase in the number of higher education institutions in the State, across the public, private, and cooperative sectors. There has also been a surge in the number of universities and affiliated institutions, which has increased access to higher education for all. Higher education in Kerala has largely adhered to the principles of equitable development, with a focus on access to education and cost-effectiveness. The social and economic mobility achieved by Keralites may be largely attributed to the availability of affordable higher education. Over the years, Kerala has tapped into the private sector, which has led to the establishment of several self-financing institutions in the State.

Kerala has 14 State universities, of which four are general, and the other 10 offer more specialised courses. Directorates and other autonomous agencies that function under the Higher Education Department implement programmes and manage most higher education institutions in the State. This includes the Directorate of Technical Education (engineering colleges, polytechnics, fine arts colleges, among others), Directorate of Collegiate Education (arts and science colleges), the Kerala State Higher Education Council (KSHEC, the State's principal higher education think tank, providing evidence-based policy advocacy to promote equity, access, and excellence within the sector), the Additional Skill Acquisition Programme Kerala (ASAP, offers industry-relevant skill training to students and the public to boost employability, delivered online and at schools, colleges and through Community Skill Parks), to list a few. Law colleges too, are under the purview of the Higher Education Department. Medical education in Kerala is overseen through directorates of the Health Department. Several national-level institutions such as IIM Kozhikode, IIT Palakkad, NIT Calicut, IIST, Thiruvananthapuram, IISER Thiruvananthapuram, NIFT Kannur, and Central University of Kerala, Kasaragod also function in the State.

Recent Accomplishments of Higher Education Institutions in Kerala

The 14 State universities have shown improved performance in recent years. Higher education institutions have made commendable progress in of the National Institutional Ranking Framework's (NIRF) India Rankings 2025. Kerala University and the Cochin University of Science and Technology (CUSAT) are ranked fifth and sixth, respectively, among State Public Universities in the country, up from ninth and tenth places in the 2024 rankings. Mahatma Gandhi University (MGU) ranked 17th, and Calicut University ranked 38th in the same category.

Kerala University stood out with a ranking of 42 in the Overall category and 25 in the University category. CUSAT followed closely, ranking 50th Overall and 32nd in the University category. MGU maintained a significant presence, placing 79th in the Overall list and 43rd in the University list.

University College, Thiruvananthapuram ranked 23rd in the Colleges category. Overall, 74 institutions from the State ranked in India's top 300 colleges, up from 71 the previous year. This includes 56 private and 18 Government colleges. The number of colleges in the top 100 increased from 16 to 18 in 2025, including four Government institutions. The College of Engineering, Thiruvananthapuram ranked in the 101-150 band for Engineering.

Investment in the Higher Education Sector

In the past four years, development projects worth Rs 6,000 crore have been implemented in the higher

education sector, to elevate higher education institutions to international standards. Out of the total investment, Rs 2,000 crore was earmarked for infrastructure development. Major projects were undertaken through funding from the Kerala Infrastructure Investment Fund Board (KIIFB), the Plan fund, and the Rashtriya Uchchatar Shiksha Abhiyan (RUSA). Infrastructure, including academic blocks, hostels, and central laboratories, has increased significantly. The newly established laboratory complexes at Kerala University and Mahatma Gandhi University are the largest of their kind in South India, marking a significant milestone in the State's expansion of its academic infrastructure. Plan expenditure in the sector is shown in Table 4.1

Table 4.1 *Plan expenditure by the Higher Education Department, Kerala, 2017-18 to 2024-25* in Rs lakh

Year	Expenditure
2016-17	63,949.5
2017-18	52,984.3
2018-19	82,114.3
2019-20	47,638.6
2020-21	62,856.3
2021-22	56,591.4
2022-23	59,034.1
2023-24	44,241.1
2024-25	34,420.4

Source: Budget documents, Government of Kerala

Infrastructure development

During the 13th and 14th Five-Year Plan periods, concerted efforts were made to strengthen higher education infrastructure. As part of ongoing reforms, such as the proposed curriculum revision and the implementation of the FYUGP programme, enhanced Plan outlays are supporting the construction of academic blocks, classrooms, laboratories, libraries, sports facilities, and other amenities.

With KIIFB funding, infrastructure development projects worth Rs 70 crore have been completed, and the buildings have been inaugurated. Additionally, 48 colleges received grants of Rs 8.5 crore each, five heritage colleges were allotted Rs 30 crore each, and 12 colleges were given Rs 10 crore each. More than 30 buildings have been completed prior to November 2020 and handed over, and basic infrastructure development work on 45 buildings is currently in progress. The construction of an airstrip for the training of NCC cadets has also been completed and inaugurated.

Technical Education

Implementing agencies under the Technical Education Department in Kerala are the Directorate of Technical Education, the Kerala Technological University (KTU), Cochin University of Science and Technology (CUSAT), the Institute of Human Resources Development (IHRD), the Kerala Science and Technology Museum, the LBS institutions, the Trest Research Park, and The Centre for Advanced Printing Technology (C-APT).

The Directorate of Technical Education is the nodal department for technical education in the State.

Engineering colleges. Kerala had 166 engineering colleges in 2024-25, with a sanctioned intake of 52,118. Out of these engineering colleges, 154 (92.8 per cent) are self-financing colleges (unaided), 9 (5.4 per cent) are Government colleges, and 3 (1.8 per cent) are Government-aided colleges. The sanctioned intake of unaided colleges in 2024-25 was 45,828 (87.9 per cent), 4,050 (7.8 per cent) in Government colleges, and 2,240 (4.3 per cent) aided colleges. The highest number of seats was in the Computer Science and Engineering branch (13,635).

At the graduate level in engineering colleges, 46.4 per cent of the students admitted in 2024-25, in Government and aided colleges, were girls. In post-graduate courses, of the 1,491 students admitted to Government and aided engineering colleges, 60.1 per cent were girls.

Polytechnics. There are 46 Government polytechnics and 6 Government-aided polytechnics in Kerala, as of 2024-25. Of this, 7 are women's polytechnics colleges. Polytechnics in Kerala offer 43 different courses. Girls constituted only 25.2 per cent of the total strength in polytechnics, while their proportions in Government and aided polytechnics were 26.8 per cent and 14.1 per cent, respectively, in 2024-25. In 2024-25, SC students comprised 9.9 per cent of the total enrolment in Government Polytechnics, and in the Government-aided sector, it was 8.3 per cent. The proportion of ST students in the Government sector was 1.5 per cent, and in the Government-aided sector, it was 0.7 per cent

Advanced skill development in technical institutions. To bridge the skill gap in Engineering and Polytechnic institutions and to connect students with future technologies, the Additional Skill Acquisition Programme (ASAP) Kerala set up Advanced Skill Development Centres (ASDCs) in 66 Engineering Colleges and 45 Polytechnics across Kerala. ASDCs partner with

Box 4.1
Academia-Industry Linkage: TrEST Park

Trivandrum Engineering Science and Technology (TrEST) Research Park, the non-profit initiative designed to foster strong collaboration between the academic community and industry, has enhanced its activities and initiated several collaborative research projects. TrEST Park has enabled the educational and business community to benefit from shared expertise, facilities, and innovation. Modelled on successful examples such as the Stanford and IIT Madras research parks, TrEST Park has successfully stimulated knowledge exchange, supported the creation of technology-driven companies, and strengthened Kerala's engineering and technology ecosystem. By providing space for industry-led research centres, facilitating incubation and spin-offs, and offering opportunities for students and faculty to engage with real-world research, the Park has started functioning effectively as a dynamic cluster of enterprises that can accelerate technological advancement and entrepreneurship development in the state. The Park has initiated essential research projects in electric vehicles and material research, including the development of the Kerala Electric Vehicle Industrial Park (K-EVIP) and an advanced Drive Train Testing Lab.

industry leaders and offer advanced courses such as artificial intelligence, machine learning, and robotic process automation. The current enrollment in skill development programmes needs to be increased several-fold to meet the declared target of massive skilling and to enhance the employability of students. This will require programmes for training trainers, engaging competent agencies, and establishing a network of skill development agencies across the State.

Collegiate Education

In 2024-25, there were 230 arts and science colleges in Kerala, of which 164 are Government-aided and 66 are Government colleges. Apart from these, various unaided/self-financing arts and science colleges affiliated with universities also function in the State.

In 2024-25, a total of 3.5 lakh students were enrolled in Government and aided arts and science colleges (for courses including BA, BSc, BCom, MA, MSC, and MCom) under the four general universities in Kerala. Of this, 2.3 lakh (65.4 per cent) were girls.

Of the total students enrolled in degree courses, 47.6 per cent were enrolled in BA courses, 36.8 per cent in BSc, and 15.6 per cent in B.Com.

In 2024-25, a total of 33,104 Scheduled Caste (SC) students were enrolled in degree and post-graduate courses, constituting 9.34 per cent of the total enrollment. The number of Scheduled Tribe students admitted to degree and post-graduate courses in 2024-25 was 8,595, which was 2.4 per cent of the total enrolment in the State.

Medical Education

In Kerala, medical education is under the purview of the Directorate of Medical Education of the Health and Family Welfare Department. The number of institutions affiliated to the Kerala University of Health Sciences (as of October 2025) is 384, with 55 Government colleges, 5 Government-aided colleges, 11 self-financing co-operative colleges and 313 self-financing colleges. The colleges fall under all systems of medicine such as Modern medicine, Ayurveda, Homeopathy, Sidha, Unani, Yoga, Naturopathy, Nursing, Pharmaceutical science and Paramedical courses. The total intake of students during 2024-25 is 29,540 (5,684 males and 23,856 females) under various health sciences streams.

There are currently 14 Government Medical Colleges, 14 Nursing Colleges, 6 Dental Colleges, 4 Pharmacy Colleges and 1 Paramedical Institute in the State. In the last decade, five medical colleges have been upgraded into Centres of Excellence with modernised casualty systems and Emergency Medicine Departments. Five new medical colleges (in Idukki, Kollam, Pathanamthitta, Kasaragod, Wayanad districts), four new dental colleges (in Malappuram, Ernakulam, Kollam, Kannur districts), and seven new nursing colleges (in Kollam, Malappuram, Pathanamthitta, Idukki, Palakkad, Wayanad and Kasaragod districts) have been made functional in the public sector. Departments of Critical Care, Genetics, Geriatrics, Interventional Radiology, Rheumatology departments have been started in medical colleges. There are plans to expand liver and multi-organ transplant units in five medical colleges. An Apex Trauma and Learning Centre has been established in the Thiruvananthapuram Medical College, and its development into a training centre is underway. Specialised centres and critical care units including Stroke Centre, Bone Marrow Unit,

Paediatric Haemato-Oncology, have been initiated in several institutions.

Ayush education. There are 25 Ayush institutions affiliated to the Kerala University of Health Sciences (up to October 2025). These are 6 Government colleges, 5 aided colleges, and 14 self-financing colleges. The colleges fall under all systems of medicine such as Ayurveda (Medicine, Nursing, Pharmacy), Homeopathy, Sidha and Unani. The annual intake of students, as on October 2025, is 1,836, of which 80 per cent students are women. The largest share of students is in Ayurveda medicine (1,320).

The three Government Ayurveda colleges are at Thiruvananthapuram, Thrippunithura, and Kannur, and have a total bed strength of 1,385. Panchakarma Hospital and Women and Children Hospital are also functioning under the Government Ayurveda College Thiruvananthapuram. In the Government colleges, the annual intake for the undergraduate degree is 226, 162 for post-graduate, and 30 for post-graduate diplomas. There are two aided Ayurveda colleges, 12 self-financing Ayurveda colleges, one self-financing Siddha college, one self-financing Unani College and 6 paramedical self-financing colleges in the State.

There is a push for research and development in Ayurveda to enhance its credibility and effectiveness, integrating traditional practices with modern scientific approaches. Investments are being made in healthcare infrastructure to support the integration of Ayurveda with modern medical practices, enhancing the overall healthcare landscape. Collaborations with educational institutions and research organisations are being encouraged to foster innovation in Ayurveda practices and products.

Homoeo medical education. The two Government homoeopathic medical colleges are at Thiruvananthapuram and Kozhikode. In addition, there are 3 aided colleges and one unaided paramedical institute. The total bed strength of the Government homoeopathic medical college at Thiruvananthapuram is 116 and Kozhikode, 100.

Significant Initiatives during the 13th and 14th Five-Year Plans

New universities. The Sree Narayana Guru Open University, the only Open University in Kerala, was established in 2020 with its headquarters in Kollam. It has made notable developments in the last five years.

The Digital University, established in 2020, is the first of its kind in the country and is designed to conduct academic programmes and research in cutting-edge digital technologies and emerging knowledge domains. It has since become a national model.

Four Year Under-Graduate Programme (FYUGP). Kerala has introduced the FYUGP in 2024-25, in the pattern of international universities, which follows the outcome-based education system. Students can choose minors, switch majors after the second year, and exit after the third year. The programme includes research, internships, and skill development, with the option to transfer between universities, while regulatory changes to allow graduates to apply for lateral admission to post-graduate programmes are in the works.

Unified academic calendar. The Government of Kerala has implemented a unified academic calendar across all State universities for admissions, conduct of examinations, and result declaration.

IT-enabled academic initiatives. Universities in Kerala, to a large extent, have been IT-enabled and digitally connected, with an artificial intelligence-based Tier 3 data centre. Universities have developed their own interfaces, tailor-made for their specific needs based on open source platforms, such as LMS (Moodle-based), UoK Meet for online meetings and classes, Koha-based Uni@Home for integrated libraries, KU Padasala (YouTube-based video archive), Safe Exam Browser for secure online examinations and assessment, Acharya mobile app for consolidating teachers' contributions, and Virtual School for online courses. Teachers use these ICT facilities and other external online resources such as e-journals, e-books, online lectures, and e-databases extensively. The significance of online resources has increased considerably since the pandemic, underscoring the need to generate massive digital content, establish infrastructure, and enhance connectivity.

e-Journal consortium. This facility provides the academic community with free access to e-journals across institutions in the country. It was achieved through the Information and Library Network (INFLIBNET) Centres, which considerably reduce expenditure. Almost all journals and databases in relevant disciplines can be subscribed to at a negotiated cost, fully funded by the Government or universities. The Kerala State Higher Education Council served as the nodal agency in the State, with participation from all universities.

Kerala Academic Libraries Network (KALNET). KALNET is a platform developed to provide access to library collections across university libraries in the State. It was launched in February 2021. The platform has

brought together 15 lakh titles across 147 libraries of 11 universities.

Computerisation of libraries. Almost all the library operations in Kerala University have been computerised using Libsys-4 software. A database of all members has been created and is updated daily. Borrower tickets are automatically generated. An RFID-based Smart Card system has been implemented for membership categories such as eminent, research scholars, and teachers. All the sections are connected through LAN.

The implementation of the Integrated Library Management System using the open-source platform Koha, which helped augment the entire library system at Kerala University, has been completed. With the introduction of the Koha Integrated Library Management System across the entire library system, students can access the services of different libraries within the University using a single RFID-enabled card. This achieves the objective of One Campus, One Library System at Kerala University.

Virtual Learning Centre. Kerala University has recently launched a Virtual Learning Centre on an experimental basis and has successfully conducted several online courses. This was done based on the free and open-source software learning management system, written in PHP and distributed under the GNU General Public License. The facilities at the Centre can be used for blended learning, distance education, flipped classroom and other e-learning projects. Virtual Learning Centres in other universities are being strengthened by diversifying their operations. Several colleges have also established similar facilities.

Bridging the digital divide initiative, by APJ Abdul Kalam Technological University. With the lockdown for Covid-19, a technology-assisted teaching-learning process became necessary. Realising the prevailing digital divide among students, the APJ Abdul Kalam Technological University's initiative supplied disadvantaged students from all the affiliated colleges of the university with laptops.

e-Governance. The administration, academic, finance, planning, and examination sections of all universities are fully automated to ensure speedy and efficient transactions for all stakeholders. The next generation of reforms in this sector will focus on more sophisticated enterprise resource planning applications and improved public interfaces.

Kerala–Enterprise Resource Planning Solution (K-REAP). K-REAP is an initiative of the Kerala State Higher Education Council supported by the Department of Higher Education, Government of Kerala, to develop an ERP software system that centralises diverse campus functions into a cohesive system. The K-REAP platform gives universities and higher education institutions a digital framework for planning, management, delivery, and monitoring of operations and services, thereby aligning with the transformative goals suggested by the Higher Education Reforms Commission appointed by the Government of Kerala. The Government has issued administrative sanctions to start this programme.

Student life-cycle management system (examination software). A comprehensive software solution to manage the life cycle of a student, from the start of the admission process to the issuance of final certificates, was commissioned in 2022 and has been implemented at Kerala University.

Automated learning and evaluation management system and infrastructure facilities for student services in MG University. This project comprising of an online learning management system (LMS), an interactive student information system to streamline the process of student admissions, an effective system for online examinations and online examination infrastructure, and call centre for managing and answering students' queries has been introduced. The MGU DASP Online Examination Centre was made functional, where 100 students can attend online examinations at a time.

Digitisation of Tabulation Registers. Mahatma Gandhi University has digitised all the examination records of its students since its inception in 1983. Those records that were on the verge of total loss are now also available in digital format.

Accreditation. The Higher Education Council has formulated the concept of a State-level accreditation mechanism, namely SAAC, in line with the suggestions of the National Assessment and Accreditation Council and the University Grants Commission, with the intention of assessing and grading institute-affiliated educational institutions. The assessments of 449 institutions have been completed.

National Board of Accreditation. To enable technical institutions to acquire international visibility and recognition, the Department of Technical Education has devised strategies to get the National Board of Accreditation for all higher-level institutions during 2022-23. All engineering colleges in the State have successfully acquired NBA accreditation status. The process is already underway for GEC, Idukki. Among Polytechnic colleges, NBA accreditation was achieved by WPTC, Nedupuzha, and five more Polytechnic

colleges have completed the registration formalities, waiting for inspection

Cluster of colleges. Cluster of colleges was conceived as an arrangement for the mutual sharing of human and physical resources among neighbouring colleges to optimise the utilisation of available facilities, thereby enhancing enrollment and the quality of education. Three Clusters, namely Thiruvananthapuram, Ernakulam, and Kozhikode, have been functioning since 2009, and they consist of five, four, and five-member colleges, respectively. New clusters have been made operational in Thalassery, Kasaragod, and Palakkad, since 2023-24.

Innovation and incubation. All the major and specialised universities have established innovation and business incubation centres. The Kerala University Business Innovation and Incubation Centre (KUBIIC) has been established, and 11 start-ups have been granted support. Recently, KUBIIC selected 52 new startups in the ideation phase (42 from the Departments and 10 from the affiliated colleges of the University of Kerala).

Industry on Campus (IoC) scheme. This has been established in all Government Polytechnic Colleges, which are identified as Additional Skill Development Centres. As part of this programme, Technology Business Incubation Centres have been established in all Government engineering colleges and selected Government polytechnic colleges, in collaboration with the Kerala Startup Mission. The Technology Business Incubators assist prospective entrepreneurs in nurturing their technology ideas and promote successful corporate entities at pre-start-up and start-up stages. They also encourage innovation among budding engineers trained by the institution by identifying and nurturing entrepreneurial talents among students and commercialising ongoing research. As part of this programme, entrepreneurship development programs (EDP) are conducted for the students and faculty by professionals employed in the industry and individuals.

Many applications are being mentored and will be ready for incubation. Additionally, around 40 pre-incubation units have been nurtured, and more than 50 units have completed their gestation period since the scheme's inception in 2014. Measures to foster innovative thinking are also implemented in colleges. With this objective, several boot camps have been organised at institutions to welcome prospective entrepreneurs.

Technology business incubation and startup initiatives in CUSAT. CUSAT established a 4000 sq.ft Technology Business Incubator (TBI) named CITTIC with a grant of Rs 1 crore from the Government of Kerala. There are 50 startups mainly run by CUSAT students and alumni working in CITTIC. The centre liaises with academics and industry to help incubators grow their businesses, providing them with the necessary support. 19 firms incubated with CUSAT TBI have won startup grants. The School of Management at CUSAT has been ranked among the top 100 B-Schools in India.

WESAT. The satellite project, WESAT (Women Engineered Satellite), was a groundbreaking mission initiated by the Space Club of LBS Institute of Technology for Women, Poojappura and has been in progress for the past four years. It is the first satellite project led by an all-women institute in the country, and LBS Institute of Technology for Women is the first college ever in the State to launch its own satellite. WESAT was developed to measure UV rays in space and on Earth's surface, as well as their influence on warm temperatures and climate change. For this, an MoU was signed with VSSC, ISRO, IN-SPACe, Department of Space and the Government of India for launching WESAT in the upcoming PSLV Mission. The project received funding from the Central Government through the DST Nidhi Prayas scheme and from the state government via the Kerala Startup Mission.

Scholarships and student support.

Higher education scholarship scheme. Under this scheme, 1,000 new scholarships are awarded annually to meritorious students to pursue non-professional undergraduate courses. The scholarships of the awardees so selected would be renewed in the ensuing years till they complete their post-graduation. The number of beneficiaries of higher education scholarships in the undergraduate and postgraduate sections for the 2024-25 academic year was 2,301 and 446, respectively.

Chief Minister's Navakerala Post-Doc Fellowship. These Fellowships have been introduced to encourage research ideas that contribute to the State's development across various sectors. The Fellowship provides financial assistance of Rs 50,000, per month (Rs 1 lakh during the second year). The scheme aims to support 500 research scholars who have completed their PhD in various disciplines, and so far, fellowships have been awarded to 177 researchers.

CM's Prathibha scholarship award. As part of the Chief Minister's 100-day programme, the Pratibha Dhan Sahaya Scheme, was launched to award 1000 scholarships to economically disadvantaged students.

An amount of Rs 10 crore has been spent on the project in the financial year 2023-24.

Hunger-free campus. The Hunger free Campus project has been implemented since 2022-23 to nurture a healthy young generation by providing good quality, low-cost food to approximately 30,000 Government college students. Currently, the college canteens are being run through Kudumbashree units. In this scheme, colleges identify economically disadvantaged students who come from adverse living conditions and provide them with mid-day meals at a rate of Rs 10. This amount is fully sanctioned for the canteens to cover their costs.

Jeevani. Through this programme, Jeevani counsellors are available to all Government and aided arts and science college students for psychological support. In 2024-25, 145 counsellors addressed 4,827 cases.

International networks. *Erudite scheme.* Erudite, a flagship programme of the Government was introduced to enhance the quality of education and research in the State's universities. It enabled the academic community to interact with outstanding scholars worldwide, including Nobel laureates. KSHEC is the coordinating agency for implementing the scheme through various universities and colleges in the State. Around 220 National and International Scholars, including Nobel laureates, have participated in different programmes organised by universities and colleges under the Erudite Scheme. In 2023-24 alone, 20 scholars were invited under this scheme.

International faculty under Global Initiative of Academic Networks (GIAN). Three courses by international faculty part of the Global Initiative of Academic Networks (GIAN) scheme have been sanctioned in Kerala University.

International Centre for Polar Studies (ICPS). This Centre at Mahatma Gandhi University has been granted membership in the University of the Arctic (UArctic), an esteemed international cooperative network in the Circumpolar Arctic region. The university launched Degree Honours Programmes at affiliated colleges and 4+1 Programmes in its study departments.

International students in Kerala. The State's outreach initiatives have also resulted in a significant increase in the number of international students in Kerala. The number of foreign student applications has increased from 1,100 in 2021–22 to 2,600 applications from 64 countries in 2024–25. The upward trend has continued, reaching 2,620 applications from 81 countries in 2025–26 (as of June 2025). This reflects Kerala's increasing attractiveness as a destination for international students in higher education.

Vijnana Kerala Programme. With the launch of the Vijnana Kerala Programme (a massive drive to skill the youth and increase their employability), the establishment and rejuvenation of placement cells have gathered momentum, with institutions reaching out to alumni, well-wishers, representatives of the Indian diaspora in other countries, and others. Many students also qualify for advanced degrees through competitive examinations such as GATE and CAT. Students have been placed in multi-national firms such as WIPRO, Mahindra, TCS, and BOSCH.

Earn while learning. ASAP established a State Internship Portal to offer graduate students the opportunity to work while undergoing a conventional educational programme. The portal aims to follow the "learning by doing" approach. The State Initiative on Internship for Employability Enhancement project is an online web platform designed in such a way that all stakeholders-students, academics and industries will meet at the same point. One of the salient features of the internship portal is that it connects students not only with sectors but also with State Departments that involve technical work.

Human Resource Development (HRD) cell. Special programmes to train the teachers to keep abreast of the latest developments in their domains have been implemented, and faculty members are encouraged to pursue advanced education. To facilitate the holistic development of youngsters with high levels of social commitment, the Human Resource Development (HRD) Cell was established in 2019-20 and is currently functioning successfully in various institutions.

***S*cheme for Her Empowerment in Engineering education (SHE).** This project was initiated at Government College of Engineering, Kannur during 2020-21, and supported by the alumni, the teaching fraternity, resource persons from external agencies, and experts from various fields, as well as the PTA and the HRD cell of the college. The online group SHE CODERS initiated mentoring programmes to provide individual attention, established a dedicated YouTube Channel, and conducted an online website development boot camp for the female student community. They also organised 'WE for WE - Women Engineers for Women Entrepreneurs' in association with Kerala Startup Mission. This virtual makeathon, held exclusively for

girls from engineering colleges across the State, helped bring together budding women engineers to present solutions to some of the challenges that women, especially new entrepreneurs, face.

The scheme was extended to all higher education institutions under DTE from 22-23 onwards.

Skill development.

Community Skill Parks. Community Skill Parks (CSPs), one of the flagship programmes of ASAP, has been conceived as an industry-led public-private partnership model of skill training. It has been developed as multi-skilled training Centres equipped with state-of-the-art training facilities in various locations across the State. CSPs operate on a hub-and-spoke model, connecting with academic institutions, vocational training institutions, and the local industry to foster a skill development ecosystem. A total of 16 CSPs are to be implemented in the State, out of which nine are already operational, while the construction works for the remaining seven CSPs are in the initial phase.

National Qualification Register (NQR). ASAP has acquired expertise and competence to develop Skill Qualifications as per the National Skills Qualification Framework (NSQF). Over the last two years, ASAP has developed five NSQF Qualifications that are now available in the National Qualifications Register (NQR).

ASAP community colleges in polytechnics. The community college model, as conceptualised and operational under the All-India Council for Technical Education (AICTE), was established to uplift the weaker sections of communities by identifying local employment and self-employment opportunities and providing relevant skill training. Training programmes are conducted by skilled knowledge providers who are real industry professionals.

She skills. This training programme for women above 15 years of age for a period of three months was introduced to the living standards of women by helping them, mostly homemakers, to learn marketable skills and promoting entrepreneurship to become economically self-sufficient. She-Skills 2019 offered 23 courses in 11 job sectors. Placement grooming and soft skills training are salient features of the programme. 5,529 women enrolled for the programme.

Production and training centres, material testing centres and advanced fabrication laboratories. To expose students to the latest development in technology and to improve the teaching-learning process through hands–on training, the Higher Education Department has set up Production and Training Centres, Material Testing Centres and Advanced Fabrication Laboratories at all Government Polytechnic Colleges in a phased manner.

Establishment of Centres of Excellence. Following the recommendations of the Higher Education Reforms Commission, the Government made concerted efforts to establish a series of Centres of Excellence in various disciplines by attracting talent from across the State and the country. Initial processes of establishing the following centres have been completed.

- Kerala Institute for Science, Technology and Innovation (KISTI)
- Kerala Institute for Advanced Studies for Social Sciences and Humanities (KIAS)
- Kerala Network Support in Higher Education (KNRSHE)
- Institute for Gender Equity
- Institute for Training of Teachers and Non-Teaching Staff
- Centre for Indigenous Peoples Education
- Kerala Language Network (KLN)
- Kerala Knowledge Consortium (KKC) Centres
- Kerala Centre for Analytical Service (KCAS)
- Kerala Institute for Policy Studies

The domains of three Centres of Excellence under APJ Abdul Kalam Technological University are for Sustainability Engineering and Carbon Neutrality to be located at Government Engineering College Kannur; Emerging Materials and Infrastructure at Rajiv Gandhi Institute of Technology, Kottayam; and Artificial Intelligence, Machine Learning, Robotics, and Automation at Model Engineering College, Ernakulam.

ASAP Kerala has established Centres of Excellence with industrial-grade labs to enhance skills and attract new industries. The Centre of Excellence for Electric Vehicles (EV) at Community Skill Park, Kunnamthanam, inaugurated on April 25, 2023, focuses on EV technology and sustainability.

In addition to the above, three autonomous inter-university centres are being set up with KIIFB funding.

- Thanu Padmanabhan Centre of Excellence in Astronomy and Astrophysics at the University of Kerala.
- Centre of Excellence in Neurodegeneration and brain health at CUSAT
- Center of Excellence in Nano Science and Nano Technology at MG University.

New research initiatives. As part of the efforts to intensify research and development in the higher education sector, particularly in science and technology, several centres and research projects have been initiated, as given below:

- Transportation Engineering and Research Centre
- Product Design and Development Centre in CET
- Re-Usable building system in RIT, Kottayam
- Rural Technology Development Centre
- Student Satellite Launch Programme at CET
- Centre for Bamboo Technology, at GEC TVM
- Interdisciplinary Research Centres at the Government Engineering Colleges
- Robotics and AI nodal Centre
- Centre of Excellence in Systems, Energy and Environment
- Centre for high-performance computing at CET
- Collaborative Research and Learning (CORaL)
- Centre for Disaster Management and Mitigation under the Directorate
- Centre for Nano Electronics
- CET- Centre for Advanced Research in Engineering (CET- CARE)
- Centre for Sustainable Development (CSD) at College of Engineering, Trivandrum,
- Centre of Excellence in e-mobility

*Interdisciplinary research centres.*The Directorate of Technical Education has initiated the establishment of Interdisciplinary Research Centres in all Government engineering colleges in specific areas identified by the host institution, in a phased manner. The Centres are envisioned to act as platforms to facilitate and promote interdisciplinary research among faculty members, thereby producing quality research outputs that are useful to society. Three centres were established during the 13th Five-Year Plan period:

- College of Engineering, Trivandrum, started work on launching a student satellite, with CET Centre for Interdisciplinary Research (CCIR) as the nodal agency.
- A nodal Centre for Robotics and Artificial Intelligence has been set up at Government Engineering College, Thrissur.
- Centre of Excellence in Systems, Energy and Environment has been set up at Government Engineering College, Kannur.

Translational research centre for APJKTU. APJ Abdul Kalam Technological University was designated as a Special Purpose Vehicle for the smooth implementation of the Translational Research Centre project in a time-bound manner.

Convergence Academia Complex in M G University. The construction of this facility in M G University, designed to promote and coordinate large-scale interdisciplinary research programmes between the centres, MNGU research schools, NGOs, research institutions and industries in India and abroad, has been completed.

Specialised technology development centres. Many specialised centres working on technological solutions were established in different engineering colleges. Out of these, the Rural Technology Development Centre at the Government Engineering College, Kannur, the Transportation Research Centre, and the Product Design and Development Centre at the College of Engineering, Trivandrum; the Reusable Building System at Rajiv Gandhi Institute of Technology, Kottayam; and the Centre for Bamboo Technology at the Government. Engineering College, Barton Hill, deserve special mention. They formulate and implement research projects with social relevance and better applicability.

Green initiatives. Universities and other higher education institutions have embarked on energy-efficient green campuses, with provisions for harnessing solar energy and implementing efficient water harvesting and waste management systems. For instance, a 100 kW grid-connected solar photovoltaic power Plant installed on the rooftop of the Golden Jubilee Building on the Kariavattom Campus generates 146,000 units of electricity per year. This is in accordance with the GO GREEN initiatives of the University of Kerala, and it is unique and one of its kind in the Indian subcontinent.

NIRMALAM – MGU. a project dedicated to promoting green vibes, has its roots in the Green Protocol campaign launched by the State Government in 2018. The successful recycling or upcycling of all solid waste and the transformation of biodegradable waste into value-added products, such as crop-friendly compost, is a major achievement of this project.

Sports infrastructure. A Memorandum of Understanding was signed by MG University for a Rs 57 crore KIIFB-funded project, establishing an

international-level indoor stadium and sports complex in collaboration with the Directorate of Sports and Youth Affairs, Government of Kerala.

Way Forward

A focused and strategic approach is required to advance the higher education sector and to address emerging challenges in support of the State's vision of becoming a knowledge economy. With the new directions in curriculum content, governance, and institutional structure, supported by investment under the 14th Plan in infrastructure, teaching quality, teacher training, and research, the role of higher education in Kerala's economic modernisation is clear. These interventions will continue even as Union Government interventions pose risks to democratic governance in State universities.

The Government recognises the impact of graduates leaving the State and is taking steps to improve the quality of higher education and related facilities in Kerala, including the introduction of new generation courses and the provision of scholarships. Increased financial support for higher education institutions is crucial to strengthen infrastructure, faculty development, research facilities, and student services. Targeted support for underrepresented groups, and institutions in remote areas is necessary to promote equity and inclusiveness.

Greater use of digital tools, e-learning platforms, virtual laboratories, and data driven academic management systems will enhance access, quality, and administrative efficiency. Capacity building initiatives will extend digital readiness to both students and faculty. Strong and sustained partnerships between higher education institutions and industry will improve the relevance of academic programmes, increase employability, and support innovation-led entrepreneurship. Collaborative projects, internships, and knowledge-sharing platforms will be institutionalised to encourage a culture of innovation and growth. Kerala aims to develop as a centre of excellence in scientific research, technology development, and skill formation. The overall objective is to build a globally competitive, inclusive, and future-ready higher education system that equips students with advanced skills and knowledge while contributing to Kerala's socio economic transformation and knowledge economy goals.

Chapter 5
The Health Sector: Investing in the People

Kerala: A Pioneer in Innovations for Public Health

The State of Kerala is widely recognised for its achievements in the sphere of health, and, in particular, public health. Over the past decade, increased investments in the health of the people have been a major feature of the policy of the Government of Kerala. The objectives of the State Government over the periods of the 13th and 14th Five-Year Plans have been, in general, to build a public health system that provides high quality preventive, curative, and palliative care through the public sector for all sections of the population of the State, despite the administrative and financial challenges arising from Union Government policies. The approach of the Government has focused on improving health infrastructure and the quality and delivery of services, converting Primary Health Centres into comprehensive Family Health Centres, and ensuring the patient-friendly transformation of secondary and tertiary care institutions to address the current health needs of Kerala. Health policy has also supported the upgrading of public hospitals at all levels and has introduced a strong focus on non-communicable diseases.

Kerala's health system continues to be noted for its inclusiveness. The Aardram Mission marked a major expansion in public health services by ensuring the availability of new services within a short distance of every household. It ensured infrastructure enhancement at every administrative level. It brought a Cath Lab to every District. Additional investment was made in subsidised inpatient treatment that exceeded the limited coverage provided under Union Government schemes. Greater attention was also given to the health needs of the elderly.

Kerala continues to receive international recognition for its performance in public health. The State consistently performs well on key health indicators, including life expectancy at birth, infant mortality rate, maternal mortality ratio, and sex ratio. Kerala ranks first among States on major national health indicators. The State secured first position among larger States in the NITI Aayog Health Index for its progress towards achieving the United Nations Sustainable Development Goals.

Kerala received the Arogya Manthan 2023 award during the annual celebrations of the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana for processing the highest number of free medical treatment claims. The State also received the best service award for visually impaired beneficiaries after introducing treatment cards in braille. Another achievement was receiving an award for conducting the highest number of molecular tests under the National TB control project. At the

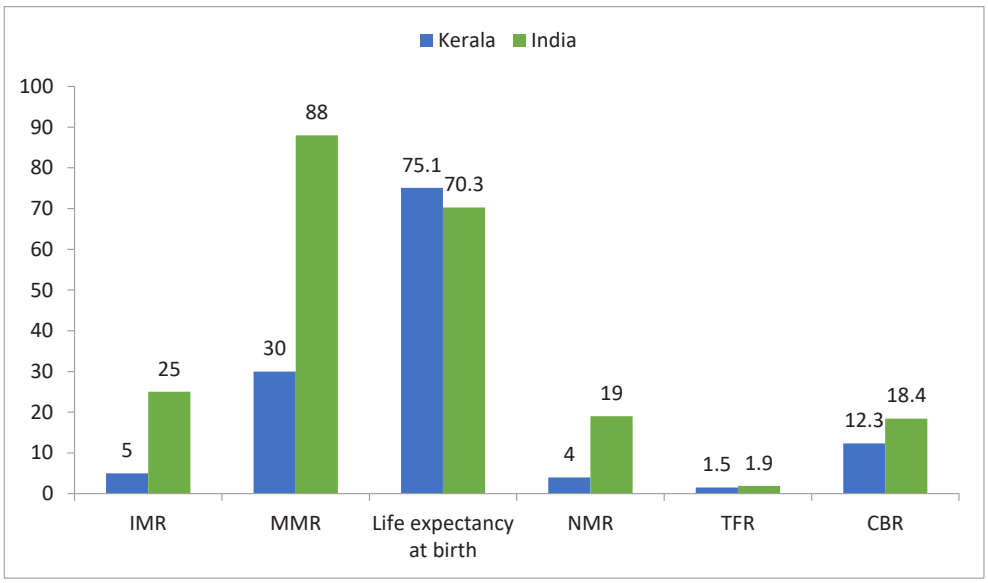

Figure 5.1 *Graphical representations of health indices for Kerala and India*

Source: Sample Registration System; National Health Profile; National Family Health Survey

Table 5.1 *Kerala's health sector in the 13th and 14th Five-Year Plans*

	13th Five-Year Plan (2016–2022)	14th Five-Year Plan (2022–2027)
Vision	Focused on comprehensive healthcare access and initiating reforms in public health delivery to ensure quality through standardisation.	Shifted towards Planetary Health, integrating health, environment and equity and moved towards UHC and sustainable well-being.
Primary Healthcare	Initiated the transformation of more than 400 PHCs into FHCs under the Aardram Mission and promoted protocol-based treatment guidelines.	Continued and expanded FHC model; accelerated upgrading of Sub-Centres into Janakeeya Arogya Kendram in urban areas, achieved quality through accreditation standards.
NCD care	Focussed screening and treatment of diabetes and hypertension at PHC-level, and started some specialist clinics. Initiated speciality services in cardiology, nephrology, and neurology in secondary level hospitals. Established dialysis units in all Talu- level hospitals, cath lab and stroke units in major District-level hospitals.	Scaled up NCD programmes with more specialist clinics and strengthened screening of more diseases, ensured continuity of care
Communicable diseases	Focused on preparedness and strengthened outbreak responses to abort the spread early (Nipah, Covid-19, etc).	Emphasised preparedness and strengthened outbreak responses, widened e-health database, initiated One Health project, reinforced lab network with Nirnaya labs and Institute of Advanced Virology.
Human resources and training	Created 3,000-plus posts: doctors (570), nurses (740), pharmacists, and lab technicians (350 plus), under DHS and initiated capacity building.	Addressed HR gaps, continued training, especially for emergency and palliative care. Used digital platforms for ongoing in-service training (Learning Management System).
Equity and access	Addressed service gaps among marginalised sections (tribal, coastal areas, migrants, etc).	Moved towards UHC, continued hospital transformations, offered greater emphasis on e-health integration, health equity, and inclusiveness.
Health financing	Encouraged insurance coverage and service expansion started Karunya Arogya Suraksha Padhathi (KASP), MEDISEP for employees and pensioners.	Restructured insurance policy integrating with PMJAY scheme to give wider coverage to reduce OOPE.

international level, Kerala received the United Nations Inter Agency Task Force Award in 2020 for its efforts in the control and prevention of non-communicable diseases.

Initiatives under the 13th and 14th Five-Year Plans

The 13th and 14th Five-Year Plans marked a significant shift from a focus solely on human health to a broader Planetary Health perspective, emphasising equity, efficiency, quality, and cultural competency to promote holistic well-being. These Plans introduced strategic initiatives aimed at strengthening Kerala's medical and public health systems through rights-based approaches.

Table 5.2 *Improvements in health indices in Kerala*

Indicator	Previous Value	Current Value
Infant Mortality Rate (IMR)	10 per 1,000 (SRS 2017 September)	5 per 1,000 (SRS 2025 September)
Maternal Mortality Ratio (MMR)	42 per 100,000 (SRS MMR bulletin 2015-17)	30 per 100,000[1] (SRS MMR bulletin 2021-23)
Life Expectancy	75 years (SRS Life Table 2016-20)	75.1 years (SRS Life Table 2019-23)
Neonatal Mortality Rate (NMR)	6 per 1,000 (SRS Statistical Report 2016)	4 per 1,000 (SRS Statistical Report 2023)
Total Fertility Rate (TFR)	1.8 (SRS Statistical Report 2016)	1.5 (SRS Statistical Report 2023)
Crude Birth Rate (CBR)	14.3 per 1,000 (SRS Statistical Report 2016)	12.3 per 1,000 SRS Statistical Report 2023)

These two Five-Year Plans aimed to transform health institutions to better address the dual challenges of non-communicable diseases (NCDs) and emerging communicable diseases. As part of this transformation, the Government proposed upgrading Primary Health Centres (PHCs) into Family Health Centres (FHCs) and Sub-Centres into Health and Wellness Centres (Janakeeya Arogya Kendram). These Plans envisioned strengthening both clinical care services and disease control programmes, with a focus on expanding these interventions to peripheral-level institutions as extensively as possible to achieve Universal Health Coverage (UHC).

A major focus of the 14th Five-Year Plan was the challenge of Out-of-Pocket Expenditure (OOPE), recognised as a critical barrier to equitable healthcare. The Plan outlined a multidimensional strategy to reduce OOPE by reinforcing the public health sector and addressing systemic inefficiencies. Through increased investment in public health infrastructure and service delivery, Kerala aimed to redesign its healthcare system to ensure greater accessibility, affordability, and sustainability.

Improvements in Health Indices

Kerala's health indices are consistently and significantly ahead of the national average, reflecting the State's long-standing investment in public health, education, gender equity, and decentralised governance.

Graphical representation of health indices for Kerala and India in terms of IMR (Infant Mortality Rate), MMR (Maternal Mortality Ratio), life expectancy at birth (years), NMR (Neonatal Mortality Rate), TFR (Total Fertility Rate) and CBR (Crude Birth Rate) are given in the Figure 5.1.

The findings from NFHS-5 (2019–21), and the Sample Registration System (SRS) reports clearly reflect a significant improvement in Kerala's health indices over the last decade. These reports highlight consistent progress in key areas such as IMR, MMR, NMR, life expectancy, and TFR.

Public Investment in Health

Kerala significantly scaled up public investment in health between 2016 and 2025, in response to evolving demographic, epidemiological, and socio-economic challenges. This period marked a significant shift towards health systems strengthening, with the goal of moving towards universal healthcare and achieving SDG 3, "ensuring healthy lives and promoting well-being for all at all ages". The investments during this period targeted infrastructure modernisation, human resources, primary healthcare transformation, digital health, and financial protection for the population. Between 2016–17 and

[1] Kerala has a robust system for reporting, reviewing, and auditing maternal deaths, with all cases reported within 24 hours and subjected to District- and State-level expert review. While annual maternal deaths typically range between 110 and 160, an abnormal rise to 220 deaths in 2021–22 was largely due to 97 maternal deaths related to Covid-19. Simultaneously, the State witnessed a decline in live births. The higher MMR of 30 reported in the latest SRS (2021–23) data reflects the statistical impact of Covid-related deaths and a reduced denominator of live births in a sample-based estimation, rather than a deterioration in Kerala's maternal health system. The earlier SRS estimate for 2020–22 (MMR 18) corresponded to fewer Covid-related deaths and higher live births, indicating no deterioration in maternal health outcomes.

Table 5.3 *Expenditure by the Health Department (revenue and capital), 2015-16 to 2025-26*
in Rs crore

Year	Total Expenditure
2015-16	5,823.9
2016-17	7,132.4
2017-18	7,499.3
2018-19	8,051.8
2019-20	8,144.6
2020-21	10,354.9
2021-22	14,472
2022-23	12,206.6
2023-24	11,046.4
2024-25(RE)	11,210.8
2025-26(BE)	12,172.9

Source: Budget documents

2024–25, Kerala has steadily increased expenditure on health. Total health expenditure (including through the Health Department, KIIFB, and LSGs) to total Government expenditure was 7.5 per cent in 2024-25 and 7 per cent in 2025-26.

Aardram Mission: Transforming Kerala's Public Healthcare Landscape

Launched in the 13th Five-Year Plan period, the Aardram Mission has revolutionised Kerala's healthcare system through a comprehensive transformation focused on accreditation, quality assurance, and institutional development. Initiated in February 2017, the Mission aimed to reduce public dependence on expensive private healthcare providers by enhancing the quality, accessibility, and affordability of public health services. Aardram brought forth sweeping improvements in infrastructure and service delivery, thereby restoring public trust and significantly increasing the utilisation of Government health facilities.

A cornerstone of the Mission was the transformation of PHCs into people-friendly FHCs. These Centres now offer patient-centric, high-quality care backed by well-trained personnel and digital integration. Key reforms included the deployment of additional healthcare personnel; enhanced access to specialist services; comprehensive training for human resources; introduction of digital health record systems through e-Health; upgraded laboratory facilities; uninterrupted availability of essential medicines; a proactive shift towards preventive rather than curative care; extension of outpatient services until 6 PM to accommodate working populations; and improved amenities such as comfortable waiting areas, web-based appointment systems, and specialised counselling and registration services for adolescents, elderly persons, postnatal mothers, and individuals with substance use disorders.

The Mission also prioritised equity in healthcare, delivering essential services to tribal, coastal, and migrant populations. Today, FHCs offer an extensive range of services, including maternal and child health care; control of infectious diseases; management of communicable and non-communicable diseases; chronic disease care; elderly care and palliative care; and regular outpatient and follow-up services.

Hospital transformations under the Aardram Mission

The Aardram Mission focused on the transformation of PHCs into people-friendly FHCs, CHCs into Block Family Health Centres (BFHCs), and strengthening of CHCs, Taluk, District, and Medical College Hospitals. PHCs were upgraded into FHCs by introducing patient-friendly outpatient (OP) services and infrastructure enhancements. Now, FHCs have facilities including a welcoming ambience, accessible ramps, side rails, clear signage, token systems, paperless registration, designated pre-check areas, and dedicated registration counters. Additional features included designated parking spaces for ambulances and other vehicles, citizen charters outlining patient rights and responsibilities, staff details, IEC corners, suggestion and complaint boxes, breastfeeding areas, and dedicated pharmacy counters.

Now, 740 FHCs, 105 Block PHCs (BPHCs), and 46 hospitals (including 8 Medical College Hospitals, 14 District/General Hospitals, and 24 Taluk Hospitals) were transformed completely. An additional 53 FHCs, 17 BPHCs, and 11 hospitals are nearing completion. Furthermore, 5,415 health sub-centres have also been renovated as part of the Mission. The conversion of PHCs into FHCs, equipped with a consistent supply of essential drugs and standardised treatment protocols, has significantly improved health outcomes and strengthened public trust in the Government health system.

Increase in hospital beds in Government hospitals

One of the direct outcomes of the Government's efforts through Aardram Mission is that people's dependence on Government hospitals has increased since the facilities

available in Family Health Centres as well as District-level hospitals have been enhanced. The total number of hospital beds has increased over these years. The bed population ratio in Kerala is 1:594 and it is 1:656 for modern medicine alone. The average doctor bed ratio in Kerala is 1:4 and it is 1:5 for modern medicine alone. The doctor-population ratio in Kerala is 1:2585. The population here is estimated for the year 2021. These figures reflect only the status of the Government sector, and they would be significantly higher if the private sector were also considered.

Urban Health Centres (UHCs)

Kerala has made significant strides in strengthening Urban Primary Health Centres (UPHCs) to address the growing healthcare needs of its urban population. These Centres play a critical role in delivering affordable, accessible, and quality primary healthcare services in densely populated and underserved urban areas. Across the State, 102 UPHCs, 6 Urban Community Health Centres (UCHCs), and 70 Urban Health and Wellness Centres (Janakeeya Arogya Kendram) were established with adequate human resources, medicines, and logistics. Laboratory facilities are also available in 65 centres. The UPHC are delivering community-based primary healthcare services, including NCD services, integrated Reproductive, Maternal, New-born, Child, and Adolescent Health (RMNCH+A) services, mental health services, referral, targeted services for the vulnerable community, and outreach services. Each UPHC has at least two specialty clinics offering weekly services and for specialties not available on-site, care is ensured through tele-consultation services.

Accreditation and quality assurance

This Mission is focused on enabling public health facilities to meet State and National quality benchmarks by pursuing various accreditation targets, including Kerala Accreditation Standards for Hospitals (KASH), KAYAKALP (for cleanliness and hygiene), LaQshya (for labour room and maternity care quality), and National Quality Assurance Standards (NQAS). As of October 2025, 255 out of 1,284 institutions (8 Districts hospitals, 8 Taluk hospitals, 13 Community Health Centres, 163 Family Health Centres, 17 Janakeeya Arogya Kendram, and 46 Urban PHCs under the Department of Health Services have achieved NQAS certification.

These certifications reflect Kerala's strong commitment to continuous quality improvement, patient-centred care, and safe clinical practices across the public health system. These efforts have significantly enhanced patient satisfaction and further strengthened public trust in Government healthcare services.

Human resource management

Given the constraints in creating new sanctioned posts, a multi-pronged human resource (HR) sourcing strategy was adopted to meet the healthcare workforce demands. This approach leveraged multiple channels, including existing government healthcare personnel, National Health Mission (NHM) contractual staff, appointments under KASP/RSBY-based hospital management systems, staff appointed through Local Self-Governments (LSGs), and DNB residents and other academic trainees.

Efforts are being made to streamline and integrate these diverse HR sources to ensure greater consistency, optimal utilisation, and operational efficiency across the health system. In the 2016–2025 period, a total of 10,382 posts were added across key health-related departments in Kerala, reflecting sustained strengthening of the health system workforce. This overall expansion underscores the State's continued commitment to improving healthcare delivery and support services throughout the decade.

Training of health care professionals

Learning Management System (LMS). The State Training Division, in collaboration with the Department of Health Services, the National Health Mission (NHM), and the Centre for Development of Imaging Technology (C-DIT), has developed a dedicated platform for e-learning in the health sector. The LMS plays a crucial role in delivering high-quality in-service education and training for healthcare personnel. It establishes a robust framework for building e-learning capacity and ensures that healthcare professionals remain up-to-date with the latest practices, protocols, and guidelines. As of May 2025, the LMS hosts a total of 127 courses, and course completion certificates have been issued to 38,759 participants.

Initiatives under NCD care services

Non-Communicable Diseases (NCDs) pose a public health challenge in Kerala. The most prevalent and high-risk NCDs include diabetes, hypertension, heart diseases, stroke, cancer, and chronic respiratory diseases (CRD). Kerala continues to report high levels of modifiable risk factors, including obesity, high cholesterol level, unhealthy dietary pattern, physical inactivity, mental stress, alcoholism, and tobacco use. These risk factors significantly contribute to the increasing burden of NCDs in the State. To tackle

this growing health threat, the Health Department has implemented comprehensive strategies focused on:

- Risk factor reduction through awareness, lifestyle modification, and community-based interventions
- Early detection and screening of NCDs through regular health check-ups and outreach programmes
- Effective treatment and follow-up care, especially to ensure drug compliance and control of blood sugar and blood pressure levels
- Strengthening of primary healthcare systems (such as FHCs and UPHCs) aimed at reducing disease burden, preventing complications, and improving the quality of life of affected individuals

NCD clinics (initially started in 2012) were strengthened to implement the Amrutham Arogyam programme for prevention and control. The strategies include;

- Annual screening of individuals aged 30 years and above is integrated into routine services for detection of diabetes and hypertension, and to prepare a State-level registry. About 2.8 crore individuals were already screened and treatment has been ensured for all including the newly detected 10.3 lakh hypertensive and about 87,000 diabetic individuals.
- Health education on healthy diet, physical activity, and the ill effects of tobacco, alcohol, and substance use
- Population-based risk factor reduction strategies
- Population-based screening launched in 2023 using the Shaili App for risk profiling
- Home-Based palliative and supportive care for bedridden and chronically ill patients

In addition, Kerala has implemented several targeted programmes for specific diseases and complications.

- Intensive Coronary Care Units (ICCU) in all Districts and cath labs in 8 Districts
- SWAAS (Stepwise Approach to Airway Syndromes) for Chronic Obstructive Pulmonary Disease (COPD) identification and management
- SIRAS (Stroke Identification, Rehabilitation, Awareness, and Stabilisation) programme for early stroke management in District hospitals
- Padasparsam (foot care programme) for diabetes-related foot complications
- Nayanamrutham (retinopathy screening and eye care) for diabetic patients
- Continuous Ambulatory Peritoneal Dialysis (CAPD) clinics for providing cost-effective dialysis for patients with chronic kidney disease
- IHCI (Integrated Hypertension and Diabetes Control Initiative) focused on continuity of care and regular follow-up.
- Super speciality clinics for Cardiology, Neurology, Urology, Nephrology and Medical Gastroenterology in selected hospitals.
- Cancer screening services decentralised to peripheral health institutions
- ASWAAS for screening and support for depression
- Mittayi programme to ensures insulin supply for children with Type 1 Diabetes

Population-based NCD screening using Shaili app. Kerala has adopted a robust digital approach to early detection and risk stratification of Non-Communicable Diseases (NCDs) through the Shaili App- an innovative, online tool designed for population-based screening. This tool enables population-level NCD screening through a structured risk assessment questionnaire designed to evaluate an individual's Community-based Assessment Checklist (CBAC) scores, thereby identifying those at higher risk. Accredited Social Health Activist (ASHA) workers conduct door-to-door visits to screen all individuals aged 30 years and above for conditions such as diabetes, hypertension, heart disease, lung diseases, various lifestyle-related ailments, and cancers. Individuals with a CBAC score above four are referred to the nearest health facility for further diagnosis and treatment. This approach supports early detection and timely follow-up of suspected cases, thereby improving health outcomes.

During the first phase of the survey, completed in February 2024, over 1.5 crore individuals (85 per cent of the target population) were screened. The screening identified 18 per cent at high risk for diabetes or hypertension, and 6 per cent at risk for cancer.

In the second phase, which began in June 2024, 1.3 crore , individuals (69.9 per cent of the eligible population aged 30 and above) were screened, as of 28 March 2025. Among them, 43.6 per cent had a CBAC score above 4, indicating high risk for NCDs. In the second phase, up to 16 factors were screened, including mental health conditions, blindness, deafness, and leprosy. All individuals identified as high-risk were referred for further diagnosis and appropriate treatment. The programme therefore has a comprehensive and focus on early detection and inclusive care.

COPD detection and treatment (SWAAS programme). This programme for the prevention and control of Chronic Obstructive Pulmonary Disease (COPD) started in February 2017 and is currently operational in 696 FHCs and 49 District/sub-District hospitals across the State. About 400 Medical Officers and 400 Staff Nurses were trained specifically for COPD and asthma management. Training included clinical screening protocols, spirometer use, and patient counselling techniques. Equipment including Oxygen Concentrators, Pulse Oxymeters, and metered dose devices, and expensive medicines such as Aerosols, were provided. Patients presenting with respiratory symptoms undergo clinical screening and referral of suspected cases for spirometry testing to confirm diagnoses such as COPD or asthma. Diagnosed patients are given treatment and regular follow-up care.

Stroke management (SIRAS Programme). This programme was launched in 2017 to strengthen stroke management services in the public health system. Stroke ICUs were established in 12 District hospitals with round-the-clock functioning CT scans, tele-radiology services, and costly thrombolytic medications. Recognising the complex nature of stroke care, which requires specialised skills, infrastructure, and, physicians in stroke management units were trained at Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), and stroke clinics were opened.

Diabetic foot clinics (Padasparsham). Foot complications are a common consequence of long-standing diabetes and can lead to serious outcomes, including limb loss, if not identified and managed early. To address this, the Padasparsham programme was launched to strengthen diabetic foot care services. Medical Officers were trained in diabetic foot management with support from the Indian Institute of Diabetes, and foot clinics have been established in 84 District and sub-District hospitals. These clinics focus on early detection, patient education, regular foot examinations, and timely intervention to prevent complications and amputations.

Diabetic retinopathy screening (Nayanamritham). Diabetic Retinopathy (DR) is a major complication of long-standing diabetes and a leading cause of preventable blindness. Early detection and timely intervention are crucial to prevent vision loss. The Nayanamritham programme was launched to address this need by facilitating early detection of DR at the peripheral level. Trained nurses and ASHAs conduct DR screening using handheld non-mydriatic fundus cameras, which capture retinal images without the need for pupil dilation. Captured images are transmitted to a State Retinopathy Centre at the Regional Institute of Ophthalmology. Here, trained optometrists evaluate the images and provide a diagnosis along with treatment recommendations. With the integration of Artificial Intelligence (AI), the programme has expanded its diagnostic capabilities to screen not only for Diabetic Retinopathy but also for Glaucoma and Age-related Macular Degeneration (AMD). Currently, this screening facility is operational in 14 District hospitals and 172 FHCs. In addition, laser machines were provided to 3 General hospital/Taluk hospitals to ensure the treatment of the retinopathy cases.

Kidney care services. In all Districts, both peritoneal dialysis centres (CAPD) and haemodialysis centres have established. Currently, 111 dialysis centres are functional with 1,266 hemodialysis machines, which have collectively provided services to 2,35,628 patients so far. In the future, FHC staff nurses will be trained in peritoneal dialysis techniques and FHCs will be upgraded as local fluid dispensing points and local support hubs to improve access and continuity of care for patients requiring home-based dialysis.

Integrated Hypertension and Diabetes Control Initiative (IHCI). IHCI is focused on continuity of care and regular follow-up. This is a collaborative project of the Indian Council of Medical Research (ICMR), Ministry of Health and Family Welfare (MOHFW), Government of Kerala, World Health Organisation (WHO), and Resolve to Save Lives Initiative of Vital Strategies. This initiative focuses on identifying and registering individuals with hypertension and diabetes and ensuring regular follow-up, treatment, and monitoring of drug compliance to achieve effective control of these conditions. Though initially designed to manage hypertension, Kerala expanded the scope to include diabetes as well. The programme was launched in 2018, initially covering 4 Districts. In 2020, it expanded to 6 more Districts, and by 2022, the remaining 4 districts were included. Currently, the programme operates in all 14 Districts. As of now, more than 10 lakh people with hypertension (20.1o per cent) and 6 lakh people with diabetes (6 per cent) have been registered under the programme. The control rate for hypertension improved from approximately 15 per cent at baseline to 36 per cent State-wide in 2024, with some Districts achieving control rates as high as 54 per cent.

Cancer care programme. The strategy focuses on three key pillars: early detection through regular screening,

accessible and affordable treatment, and community awareness and education about risk factors. All public health institutions conduct dedicated cancer screening clinics on fixed days to ensure early diagnosis for the detection of breast cancer, oral cancer and cervical cancer. These screenings are supported by trained staff, standardised protocols, and referral systems for timely diagnosis and follow-up treatment. One or more health facilities in each District were upgraded as referral centres, equipped with the necessary infrastructure and trained staff for sample collection and diagnosis. Arrangements were made in all Family Health Centres (FHCs) and hospitals to conduct fixed-day cancer clinics to identify high-risk individuals and send samples to referral centres for diagnosis. Approximately 33 lakh individuals were screened, and 53,558 suspected cases were referred for further assessment. The suspicion rates were 1.80 per cent for breast cancer, 2.6 per cent for cervical cancer, and 0.3 per cent for oral cancer.

Cancer Grid system. Connecting three cancer centres, cancer treatment units in medical colleges, cancer care units in District hospitals, and peripheral health institutions- established in all Districts to ensure treatment for all suspected cases.

Cancer Screening portal. Developed by e-Health to facilitate the monitoring of referrals and back-referrals. The development of a population-based cancer registry (Kerala Cancer Registry) and a Bone Marrow Donor Registry have also been initiated.

Zero profit anti-cancer drugs scheme (Karunya Sparsham). Launched to make high-cost cancer medications available to patients at company prices through designated Karunya pharmacies, ensuring affordability and improved access to treatment.

Arogyam anandam. A year-long campaign to raise awareness and promote intensive screening for breast, oral, and cervical cancers, was launched in February 2025. The first phase, focusing on breast and cervical cancer screening among women, was completed in March 2025. During the campaign, 14,67,442 individuals were screened across 1,525 institutions, and 49,215 suspected cases were referred for further assessment.

Box 5.1
Regional Cancer Centre (RCC), Thiruvananthapuram

The Regional Cancer Centre, Thiruvananthapuram (RCC) is a Government-supported centre for diagnosis, treatment and control of cancer in Kerala. It is rated amongst the top three of the 28 regional cancer centres in the country. It is also affiliated with the World Health Organisation, and other international institutions. The activities of RCC include cancer prevention, treatment, research, and training of specialised oncology professionals.

RCC has reviewed over 21 lakh cases between 2016 and 2025. There are various State and Union Government schemes which ensure free or subsidised treatment to eligible patients.

Between 2016-17 and 2024-25, RCC introduced several advanced technologies for cancer treatment including CerviScan for cervical cancer detection;a Ring Gantry Linear Accelerator (Halcyon) with kilovoltage imaging systems; a Gallium-68 generator; a Uro-brachytherapy unit; the Da Vinci Xi robotic surgical system for precision; the HIPEC (Hyperthermic Intraperitoneal Chemotherapy) facility; and a state-of-the-art 3-Tesla MRI scanner and a 3-D digital mammography unit. A new 14-storey building which houses a radiotherapy block, and a modern dietary department are nearing completion. A Patient Welfare Block (4,800 sq.ft.) was inaugurated in 2024.

RCC is a nationally recognised centre for oncology education) and is approved by the Medical Council of India. RCC is also a major research centre, conducting basic research, epidemiological studies and clinical research, in collaboration with reputed national and international centres. Between 2016-17 and 2024-25, RCC awarded PhDs to 100 scholars, undertook 142 research projects, acquired six patents, received 95 awards, published 720 research studies and 10 book chapters, participated in 1,200 conferences, and organised 24 conferences. Currently, there are 12 extramurally funded projects in RCC. RCC has also prepared hospital-based and population-based cancer registries.

RCC is one of the centres that will be upgraded to State Cancer Centre under the National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) by Ministry of Health and Family Welfare.

Healthy Life Campaigns

These campaigns aim to promote behavioural change for a healthy lifestyle, positive mental health, and overall well-being, and have been initiated at both the State and District-levels. Structured lifestyle modification interventions for individuals with diabetes and hypertension have been launched in 603 Janakeeya Arogya Kendrams through peer group sessions. A State-level campaign will soon be launched through Janakeeya Arogya Clubs within these centres to conduct grassroots-level awareness programs with active public participation.

Arogyabheri. A comprehensive cancer and NCD-control programme, launched in Malappuram to reduce cancer incidence through lifestyle modifications and to develop diagnostic and treatment facilities for cancer within the District.

Jeevathaalam. Campaign initiated in Kozhikode District to control NCDs by promoting healthy eating habits and food culture, encouraging agriculture and physical activity, implementing de-addiction measures, and providing related training.

Ardra Vidyalayam. Launched in Wayanad District in collaboration with Vidyakiranam and Haritha Keralam Missions, aims to raise awareness among students about healthy eating habits, de-addiction, and hygiene.

Haritham Arogyam. Campaign launched in Wayanad to ensure healthcare coverage for all Haritha Karma Sena members.

Arogya Jeevanam. Along with the Race to Health campaign, was launched in Idukki District, to sensitise youth about the harmful effects of drug use.

Mental Health Programme

Kerala has adopted a holistic and decentralised approach to mental health care, integrating mental health services into the general health system and expanding outreach through community-based initiatives. According to the mental health policy of the State, the treatment for mental illness should be made available from PHCs onwards, and higher centres need to be upgraded. Thus, Aswasam programme and Sampoorna Manasika Arogya programmes were initiated and three new mental health centres were expanded. Aswasam programme is meant for early detection of depression through screening at peripheral level and support by counselling or psychiatric care. In Kerala, this is available in 471 FHCs. The Sampoorna Manasika Arogya programme is a comprehensive program including case detection campaigns to identify unidentified cases in the community through trained ASHA workers and their integration to FHCs for treatment, follow up and referral. In order to enable the programme, 18,397 ASHAs were trained, and it was implemented in 642 Gram Panchayats. Three District-level mental health centres were expanded to 1,366 bed strength and can serve 10,000 out-patients per month. In addition, 31 day care homes were started to provide day care to recovered but neglected patients.

District Mental Health Programme (DMHP). DMHP is functioning in all 14 Districts and conducts mental health clinics in primary health institutions, supplies medicine, conducts public health education to reduce stigma, trains of doctors, nurses, pharmacists, and health workers, and makes targeted interventions such as substance abuse prevention, suicide prevention, geriatric mental health, and stress management.

Elderly and Palliative Care Services

Elderly and palliative care services, as per the revised Palliative Care Policy, were established in all Districts by integrating the existing palliative care systems of the Local Self-Government Department (LSGD) and the Social Justice Department with the Health Department to provide home care for bedridden and chronically ill patients, ensuring regular visits, medicine delivery, basic nursing and physiotherapy support and emotional and psychological care. The programme provides continuous medical support to approximately 1.1 lakh elderly and bedridden patients through 1,142 primary palliative care units and around 27,000 elderly patients through 345 secondary palliative care units. Additionally, about 1.5 lakh seriously ill patients, though not bedridden, also receive home care as needed. Palliative care units have already been established in 8 medical colleges, 44 ISM (Indian Systems of Medicine) institutions, and 18 homeopathy institutions. Plans are underway to start palliative care units in 5 Government medical colleges, along with paediatric palliative care units in selected hospitals. Ten-bed geriatric wards have been established in 21 major hospitals across the State.

Paraplegic rehabilitation platforms. Developed at Ernakulam General Hospital and Malappuram District Hospital in collaboration with Kudumbasree

Palliative Care Grid. Developed and implemented to capture all palliative care activities in real time. This digital network aims to enhance service delivery and ensure continuity of care, enabling every patient in need of palliative care to receive timely services from the nearest institution. The system allows for effective monitoring of services at various administrative levels.

Diploma Course in Domiciliary Nursing Care. Six-month course, 232 students already trained.

Dental Healthcare Services

Dental services are available in 36 District hospitals, 80 Taluk hospitals, and 40 Community Health Centres. There is plan to upgrade with specialty dental care services in these hospitals. Dental surgeons will be posted in all 152 block-level CHCs to provide dental care services.

Communicable Diseases: Overview and Control Strategies

Despite having a strong public health infrastructure, Kerala continues to face the challenges of communicable diseases due to the high population density, urbanisation, climate variability, and increased human-animal interaction. Although the State has been successful in controlling several communicable diseases earlier, the outbreaks of dengue, leptospirosis, malaria, hepatitis, H1N1, scrub typhus, and Covid-19 have happened in recent years. The State has adopted a multi-pronged approach to prevent, detect, and control communicable diseases through effective surveillance, community participation, and inter-sectoral coordination and dedicated isolation blocks in all medical colleges. The State has constructed ten-bedded isolation wards in 51 District/ sub-District hospitals and medical colleges, and construction is progressing in 32 additional sites to strengthen infection control measures. A community-based health volunteer programme called Arogyasena, comprising Anganwadi workers, ASHAs, and community representatives, was introduced to monitor and control communicable diseases. The volunteer teams conduct periodic home visits to identify mosquito breeding sites, assess sanitation conditions, and implement necessary control measures. The Kerala Institute of Virology has been established to enhance the public sector's capabilities in dealing with health emergencies.

Kerala has faced multiple outbreaks of the Nipah virus since the first reported case in 2018. Given its high fatality rate and zoonotic origin, the State has adopted a comprehensive and proactive approach to detect, contain, and manage Nipah infections. Key components of the Nipah response strategy included rapid detection and isolation through effective surveillance systems; opening isolation wards with infection control protocols; intensive contact tracing and quarantine using digital tools; zoonotic surveillance and creation of community awareness through public health campaigns. The swift and coordinated responses have been internationally acknowledged, particularly for its ability to contain outbreaks without allowing widespread community transmission.

The State adopted a scientific, decentralised, and people-centered approach to tackle the pandemic of Covid-19 since confirming the first case on January 30, 2020. Key strategies included early preparedness and surveillance; rigorous airport screening, contact tracing, and implementation of quarantine protocols. The State also launched the Break the Chain campaign to promote hand hygiene, mask usage, and physical distancing, while emphasising early and widespread testing, tracking, and treatment. The high vaccination coverage, achieved through effective public communication, mobilisation efforts, and special drives targeting vulnerable groups, including the elderly, bedridden patients, and tribal populations, also contributed significantly to the containment of the disease. The State leveraged its strong LSGs and community networks, such as Kudumbashree, ASHAs, and volunteers, for community mobilisation and engagement. Community kitchens, home delivery of medicines, and psychosocial support coordinated at the ward level enhanced public acceptance and participation. The establishment of dedicated Covid hospitals and First-Line Treatment Centres (FLTCs), along with the ramping up of ICU and ventilator facilities, significantly improved treatment success rates. Telemedicine services, mobile applications like Covid Jagratha, and home isolation monitoring teams ensured continuity of care. Daily press briefings and dashboards ensured transparency and helped build public trust. Kerala's real-time data reporting and District-wise dashboards served as models for other States. The response was recognised globally for its efficiency and community involvement.

The State has prioritised the eradication of six diseases: Malaria, Filariasis, Tuberculosis (TB), Leprosy, Measles, and Kala Azar. As of now, 1,019 LSGs have achieved the targets for malaria elimination, and 11 Districts have met the goals for filariasis elimination. All Districts, except Palakkad, have accomplished the targets for Kala Azar elimination. The TB-Free Award has been conferred on 131 Gram Panchayats in recognition of their successful TB control efforts.

Kerala Public Health Act, 2023

In 2023, the Kerala Legislative Assembly passed the Kerala Public Health Act, replacing the out-dated Travancore - Cochin Public Health Act of 1955 and the Madras Public Health Act of 1939. This comprehensive legislation establishes a unified legal framework for

public health governance across the State. It underscores the importance of addressing social determinants of health, including access to clean water, proper sanitation, and efficient waste management. The Act also makes it mandatory for all public and private health institutions to report notified diseases to the respective State or District Public Health Authority.

One Health Initiative

The One Health Initiative was launched in collaboration with KARSAP (Kerala Antimicrobial Resistance Strategic Action Plan), the Rebuild Kerala Initiative (RKI), and the World Bank to facilitate the surveillance of zoonotic and emerging diseases and their causative factors. Guidelines are currently being developed for joint outbreak investigations by various departments to identify and confirm priority infectious diseases in Kerala, including Leptospirosis, dengue, chikungunya, zika, avian influenza, encephalitis, diarrhoea, Japanese Encephalitis, West Nile Fever, monkey fever, and Nipah.

In the first phase, the initiative began operations in the four Pamba River Basin Districts (Pathanamthitta, Alappuzha, Kottayam, and Idukki) through community surveillance involving 2,53,726 trained individuals (2,21,674 community volunteers and 32,052 community members) using the Joint Outbreak Investigation Guidelines. A community-based disease surveillance system has been implemented across 150 LSGs in these Districts, successfully achieving the targets set for the first three years. In the second phase, the initiative will be expanded to cover 266 LSGs in these Districts and extended to other Districts across the State.

The State-level Centre for One Health Kerala (COH-K) and the District Programme Management and Support Units (DPMSUs) in the four initial Districts have become operational. Additionally, a One Health Centre for Nipah Research has been established at the Government Medical College, Kozhikode.

Kerala's Comprehensive Action Against Antimicrobial Resistance (AMR)

Antimicrobial Resistance (AMR) is a growing global threat that undermines the effectiveness of antibiotics and poses serious risks to public health, food safety, and sustainable development. Recognising this challenge early, Kerala has emerged as a frontrunner in India's fight against AMR, implementing a coordinated, multi-sectoral response. Kerala Antimicrobial Resistance Strategic Action Plan (KARSAP) was launched in alignment with the National Action Plan on AMR and the WHO Global Action Plan in 2018 under the One Health programme to reduce the emergence and spread of resistant microbes. AMR surveillance is carried out through the State-level microbiology network and linked with the ICMR-AMRSN (Antimicrobial Resistance Surveillance Network).

Kerala adopted a unique model, the Hub and Spoke model for AMR surveillance, that has primary and secondary level facilities as spokes and a central hospital as hub. This model facilitates the extension of diagnostic stewardship programmes to remote areas of the District, enabling the capture of real-time data and surveillance across various healthcare levels.

The Sepsis Management Program, initiated at General Hospital, Ernakulam to promote rational antibiotic therapy, was scaled up to 31 nearby hospitals through the Hub and Spoke model. Now, all 14 Districts in Kerala now have District-level AMR labs, connecting 185 spoke hospitals across the State. A blue-coloured cover was introduced for antibiotic packaging to help regulate antibiotic sales. The Drug Control Department, under PROUD (Programme on Rational Use of Drugs), conducts regular pharmacy inspections to ensure antibiotics are dispensed only with a valid prescription. The Antibiotic Smart Hospital and Panchayat initiative was launched to transform hospitals and LSGs by implementing 10 key antibiotic stewardship criteria. Aiming to create an Antibiotic Literate State, a State-wide AMR awareness campaign was started and covered more than 4 lakh households. The integrated approach has led to measurable improvements in prescribing practices, reduced antibiotic misuse, and enhanced public awareness.

Nirnaya Lab Network

A comprehensive system for the diagnosis of both common and rare diseases has been developed through the networking of public sector laboratories using a hub-and-spoke model. District Diagnostic Laboratories (DDLs) have been established in all Districts, supported by a reliable specimen transport system from peripheral centres to the DDLs, along with a quality assurance monitoring system across entire laboratory networks. Histopathology, cytopathology, microbiology, and biochemistry tests are available at the DDLs. Specialised diagnostic services such as cancer diagnosis, TB screening, newborn screening, and antimicrobial resistance (AMR) detection are also provided through this network. This laboratory network ensures high-quality diagnostics through regular internal and external

quality control processes. Of the 1,262 institutions in the network, 1,158 (91.8 per cent) are covered under the Nirnaya laboratory network. Laboratories in three District hospitals, 32 CHCs, 21 Taluk hospitals, and 539 FHCs have achieved standardisation.

e-Health Programme

This project aims to develop a data base of electronic medical records of all families and individuals in the State through computerised network of health institutions. The project leverages technology to ensure efficient delivery of health services, improved patient care, and robust data-driven decision-making. As part of the programme, citizens will be issued a Unique Health Identification Number (UHID), which links their medical records across all Government health institutions in the State and enables the development of digitised lifetime health records that can be accessed by authorised healthcare providers across institutions. Patients can book appointments and avoid long queues, thereby improving patient flow and service efficiency. The system automates hospital operations from registration and outpatient management to diagnostics, pharmacy, and billing. The platform is integrated with various public health programmes such as NCD screening, cancer screening, mental health, and maternal and child health initiatives. Data from health facilities is utilised for surveillance, planning, and policymaking through real-time dashboards and reports.

As of 2025, the e-health infrastructure has been strengthened and upgraded across all District headquarters and 686 health institutions to enhance the functionality of the health information system. These upgrades support predictive modelling, continuity of care, data-driven decision-making, and the development of disease registries, bio-repositories, and community-level data platforms. The improvements have significantly enhanced surveillance systems, enabling faster and more accurate prediction of disease trends and outbreaks. Networking of institutions at various levels has facilitated resource sharing, training, research, and technical support, while also fostering public-private-academic partnerships. More than 2.5 crore citizens have been registered (approximately 1.3 crore men, 1.3 crore women and 816 transgender persons) from around 68,35,747 households, with over 5 crore consultations recorded digitally.

Telemedicine service, which enables remote consultations, is an added advantage, especially benefiting people in rural and hard-to-reach areas. This platform has 4,727 doctors, including specialists, and serves a daily average of 500 to 750 individuals across the State. The average consultation duration is 6 minutes and 15 seconds, while the average waiting time is 5 minutes and 55 seconds. Specialty services offered include care for NCDs, oncology, psychiatry, mental health, general medicine, paediatrics, dental care, dermatology, pulmonology, cardiology, gynaecology, ENT, adolescent health, palliative care, ophthalmology, general surgery, orthopaedics, haemophilia care, physical medicine and rehabilitation, as well as Ayurveda and Homeopathy outpatient services.

Anaemia and the VIVA Kerala Initiative

Anaemia is a widespread public health issue in Kerala, especially among women, children, and adolescents. It is primarily caused by iron deficiency but may also be associated with other nutritional deficits, infections, or chronic diseases. If left untreated, anaemia can lead to impaired physical and cognitive development in children, reduced productivity in adults, and increased risk during pregnancy and childbirth. VIVA (Vilarchayil Ninnum Valarchayilekku) Project is a specific programme aligned with Anaemia Mukt Bharat aimed to strengthen and contain anaemia among children, adolescents and women in the reproductive age group. The VIVA (From Deficiency to Development) project launched in 2023, screened, treated anaemia and increased awareness among the girls and women aged 15 to 59 years. Under this programme, haemoglobin levels are monitored using haemoglobinometer. Awareness classes are being conducted, and iron-rich recipes are shared through Kudumbasree units. About 7.5 lakh women were screened, and treatment (including blood transfusion as needed) was ensured. As a result, 60 per cent of women across all target groups have been made anaemia-free. Kerala is the only State to have achieved this level.

Family Welfare Schemes for Mother and Child Health Services

Maternal health services

Approximately 92 per cent of pregnancies in Kerala are registered during the first trimester, facilitated through the outreach services of ASHA and Junior Public Health Nurse (JPHN). A minimum of four antenatal care (ANC) visits was ensured for all pregnant women through tracking on the Reproductive and Child Health (RCH) portal. During these visits, women received tetanus toxoid (TT) immunisation, anaemia screening, nutritional counselling, and appropriate supplements. About 19 per cent of pregnancies have been identified as high-risk early via Mother Care Cards and e-health

tracking systems. Functional emergency obstetric care (EmOC) units were established at Taluk/District hospitals to take care of them. All Taluk, and District hospitals are now equipped to handle normal and caesarean deliveries, contributing to a high institutional delivery rate of 98 per cent. Advanced maternal care and surgical interventions are provided free of cost under the Thalolam and Karunya schemes, which cover both public and empanelled private hospitals. These initiatives contributed to a significant reduction in the caesarean section rate, from over 60 per cent to below 45 per cent.

Child health services

Kerala has established a comprehensive and robust child health system. The State has expanded the immunisation schedule to include multiple vaccines beyond the traditional six vaccines. The new vaccines introduced were the Pentavalent Vaccine (DPT + Hep B + Hib) in 2011, Inactivated Polio Vaccine (IPV) in 2015, Measles-Rubella (MR) Vaccine replaced MMR for routine use, Rotavirus Vaccine in 2019, and Pneumococcal Conjugate Vaccine (PCV) in 2021.

The full immunisation coverage of the State is more than 90 per cent. The Mission Indradhanush and Intensified Mission Indradhanush (IMI) were strategically implemented in low-coverage areas, including tribal belts and urban slums, to improve immunisation rates among underserved populations. These campaigns featured special outreach sessions, mobile vaccination teams, and catch-up rounds targeting children who had missed scheduled vaccines. Immunisation efforts were closely integrated with school health programmes, ensuring vaccine updates for pre-school and school-aged children, thereby strengthening routine and booster immunisation coverage.

The Electronic Vaccine Intelligence Network (eVIN) was adopted to streamline the vaccine stock management and cold chain logistics, ensuring timely availability and reduced wastage of vaccines. The RCH Portal and Mother-Child Tracking System (MCTS) were effectively used to enable real-time tracking of beneficiaries, improving coverage and continuity of care. In the post-Covid-19 period, digital registration systems became more widespread, along with the use of mobile-based reminders for scheduled immunization visits, enhancing timely vaccine uptake and reducing dropouts.

Under the RBSK (Rashtriya Bal Swasthya Karyakram), children from birth to 18 years are screened for 4Ds: defects at birth, diseases, deficiencies, and developmental delays. All District and many Taluk hospitals are equipped with SCNUs/NICUs to manage low birth weight, pre-term, and sick new-borns. The neonatal mortality rate has declined steadily due to better infrastructure and early referral systems.

New-Born Screening (NBS) programme

In order to detect disorders in new-borns early and enable timely interventions to reduce illness and deaths, the State strengthened its NBS programme in 2017. The conditions screened are Congenital Hypothyroidism (TSH), Congenital Adrenal Hyperplasia (OHP), Phenylketonuria, Glucose-6-Phosphate Dehydrogenase (G6PD) Deficiency, Galactosemia, Hearing loss, and congenital heart disease (CHD) in addition to the routine screening for visible birth defects at all 99 public delivery points. Blood samples are collected using the heel-prick method on filter paper between 48 to 72 hours of birth and transported to PH and RPH Labs. The State has established a fully equipped newborn sample transport system, and metabolic screening reports are captured through a centralised digital tracking system (Jatak Seva app). During the period from March 2013 to January 2025, a total of 12,42,347 cases have been screened through this programme. Infants diagnosed with CHDs receive free treatment under the Hridayam for Little Hearts scheme.

Trauma care services

A new Trauma Policy was formally released as part of the 14th Five-Year Plan, marking a significant step in Kerala's efforts to strengthen its emergency medical response system. In alignment with this policy, the Kerala Health Department launched an emergency trauma care service in 2017, named Kanivu (Kerala Ambulance Network for Indisposed Victims). This initiative aims to develop a structured trauma care delivery system supported by real-time data, geospatial planning, and centralised coordination. Kanivu is integrated with the existing 108 ambulance network and is staffed by trained personnel, including Emergency Medical Technicians (EMTs). Each ambulance is equipped with modern life-saving equipment and GPS tracking, ensuring real-time location monitoring and swift response.

A dedicated call centre has been established to coordinate ambulance deployment, improving efficiency and response time. Under the Health Department, 52 District and Taluk hospitals and one CHC have been equipped with dedicated trauma care facilities. A nodal officer has been appointed at each of these hospitals to oversee trauma care delivery and ensure timely and uninterrupted services. To further strengthen trauma care, capacity-building initiatives have been undertaken, including the introduction of Emergency Medical Technician (EMT) courses, training for first responders and hospital staff in Golden Hour emergency protocols. Dedicated trauma care centres are also established in all Medical Colleges across the State with sufficient trained staff and facilities.

Research activities

An Ethics Committee and a Technical Committee have been constituted at the State Health Systems Resource Centre (SHSRC) to review and approve research projects within the Health Department. SHSRC is taking a leading role in research across several key domains, including NCDs, palliative care, mental health, elderly health, and epidemic prevention. Collaborations have been initiated with leading research institutions such as the Institute of Advanced Virology (IAV), Rajiv Gandhi Centre for Biotechnology (RGCB), National Institute of Virology (NIV), and the Institute of Genomics and Integrative Biology (IGIB) to advance health research in the State.

The State has also initiated the establishment of the Centre for Disease Control - Kerala (CDC-K) to coordinate disease control efforts, facilitate academic and clinical research, and support evidence-based policy formulation. Additionally, the Kerala One Health Centre for Nipah Research and Resilience has been set up at the Government Medical College, Kozhikode, to lead collaborative research focused on enhancing community resilience against recurring epidemic diseases such as Nipah and avian influenza. Among the 34 research programmes undertaken under the guidance of SHSRC, seven have been completed, while the remaining 27 are at various stages of progress. Additionally, six research projects are being conducted with funding from the Indian Council of Medical Research (ICMR), and another six are supported by the Kerala State AIDS Control Society (KSACS) and the National AIDS Control Organisation (NACO).

Health Assurance

Karunya Arogya Suraksha Padhathi (KASP) is the comprehensive health insurance programme of the Government of Kerala, implemented through State Health Agency (SHA, established in May 2020). The programme was designed by converging all previous Government-sponsored health insurance schemes including Rashtriya Swasthya Bima Yojana (RSBY), Comprehensive Health Insurance Scheme (CHIS), Senior Citizen Health Insurance Scheme (SCHIS), and the current Pradhan Mantri Jan Arogya Yojana (PM-JAY). There are currently 597 empanelled hospitals in Kerala, of which 394 are private hospitals and 203 are public hospitals (including five Government of India hospitals).

KASP provides cashless, annual health coverage of up to Rs 5 lakh to 42.1 lakh families in the State in assurance mode. Of the families covered by the KASP programme, only 23.98 lakh families are covered under PMJAY, with just 60 per cent of the fixed PMJAY insurance premium covered by the Union Government. Between July 2020 and August 2025, there have been about 57 lakh claims through KASP, and nearly Rs 4,700 crore disbursed. Over 80 per cent of this amount has been met by the Government of Kerala, with the rest covered as the Union share.

SHA is also responsible for implementing other important health initiatives such as the Karunya Benevolent Fund (KBF), Arogyakiranam Scheme (AK) and Shruthitharangam scheme. For families earning less than Rs 3 lakh per year who are not included under KASP, KBF offers cashless treatment benefits of up to Rs 2 lakh per family, with an extra Rs 1 lakh available for kidney-related care. AK provides comprehensive healthcare services to the children below 18 years who are not covered under other schemes. Free cochlear implant surgeries and associated services such as auditory-verbal therapy, device repair, and processor upgrades for children with severe hearing disabilities are supported through the Shruthitharangam Scheme for children up to 3 years of age, and selected children above that age.

KASP-branded kiosks have been established in all empanelled hospitals to ensure quick and efficient services from the time of card registration to patient discharge. One 24/7 toll-free helpline was established for addressing queries and complaints. KASP has earned several accolades at the national level for its excellence in healthcare delivery and innovation in scheme implementation.

AYUSH (Ayurveda, Yoga and Naturopathy, Siddha, Unani, and Homoeopathy)

The AYUSH sector in Kerala has made significant progress through a range of initiatives designed to strengthen healthcare services in Ayurveda, Siddha, Unani, Homoeopathy, Yoga, and Naturopathy. The State has invested substantially in infrastructure and worked to improve access to AYUSH services State-wide, including palliative care, school health services, and mobile medical units in all Districts to promote the benefits of these traditional systems. Kerala has also implemented the Kayakalp award to assess and enhance hygiene and infection control standards in AYUSH institutions. These efforts are bolstered by funding that supports treatment centers under the Indian systems of medicine and homoeopathy throughout the State. Kerala also implements the Government of India's National Ayush Mission (NAM) to promote AYUSH medical systems through cost-effective AYUSH services, strengthening of educational systems, and facilitating the enforcement of quality control of Ayurveda, Sidha, Unani and homoeopathy drugs and medicinal plants.

Kerala's approach to Ayurveda aligns with its broader Sustainable Development Goals (SDGs), emphasising health, well-being, and economic growth, while highlighting the State's focus on both healthcare and tourism sectors

Indian System of Medicine (ISM). Kerala is recognised for its rich tradition in Ayurveda, which attracts both domestic and international tourists. The Department of the Indian System of Medicine renders medical aid to the people through the network of Ayurveda, Sidha, Unani, Visha, Netra and Naturopathy institutions. Speciality hospitals such as Mental Hospital (1), Panchakarma (1), Nature Cure (1), Siddha (1), Visha (3), Sports Ayurveda (1) and Marma (1) are also functioning under this Department. At present, there are 130 hospitals and 818 dispensaries under the Department which include Ayurveda (806), Visha (4), Siddha (6), Nature Cure (1) and Unani (1). The total bed strength of these hospitals is 3,154. The State Medicinal Plants Board coordinates matters relating to the cultivation, conservation, research development and promotion of medicinal plants in the State.

Special projects were implemented by the ISM in addition to the normal medical treatment. OUSHADHI is the largest manufacturer of Ayurvedic medicines functioning in India in the public sector, and the exclusive supplier of Ayurvedic medicines to Government hospitals and dispensaries of the Ayurveda Department. ISM Department supplies this medicine to poor patients in the State, free of cost.

Kerala aims to leverage its Ayurveda heritage to enhance wellness tourism, contributing significantly to the local economy. The Kerala Government is actively promoting Ayurveda through various initiatives, including the Responsible Tourism, which emphasises community involvement and sustainable practices. The growth of the Ayurveda ecosystem, investment in infrastructure, and the potential for wellness tourism, showcases Kerala's commitment to promoting traditional medicine. The Ayurveda sector is a major employment generator, providing jobs in various fields, including healthcare, hospitality, and tourism. Despite its strengths, the Ayurveda tourism sector faces challenges such as competition from other wellness destinations and the need for standardisation in service quality. There are also barriers related to marketing and promoting Ayurveda effectively on a global scale.

Homoeopathy. The development of homoeopathy in Kerala is supported by various Government initiatives, including funding for AYUSH sector projects. The State aims to enhance homoeopathic services and integrate them into public health, reflecting a commitment to expanding healthcare options for its residents. There are 709 homoeopathic dispensaries, 14 District hospitals, 17 Taluk hospitals, 2 ten-bedded hospitals and one hospital with total bed strength of 1,000 under the Homeopathy Department in the State. In addition, Kerala State Homoeopathic Co-operative Pharmacy (HOMCO) Alappuzha, a medicine manufacturing unit is also functioning under the Homeopathy Department.

Way Forward

In the past ten years Government policy has led to better preventive and curative facilities, vastly improved and socially inclusive access to health facilities, rapid and significant progress in health infrastructure, a new focus on the health needs of the elderly, and on non-communicable diseases. Despite the impediments created by Union Government policy, the Government of Kerala will continue its efforts to assure all people in the State with access to the best and most advanced means of healthcare.

Chapter 6
Gender and Development in Kerala: A Policy Report

Women are the linchpin of the development process, and the empowerment of women is an essential condition for ensuring the success of the development effort. Government policy in Kerala has long recognised that gender equality and emphasis on the specific social and economic concerns of women are central to the development process as a whole. This comprehensive concern is reflected in Kerala's gender budgets. Kerala has been a pioneer in the process and methodology of gender budgeting, and the State's first gender budget was presented in 2008-09. The priorities of the Government with respect to gender are laid out in these budgets. Over the years, concerns of modern employment and modern skilling have taken on a new significance in gender budgets, alongside measures to further enhance women's education and health. The gender focus of the Plan has led to important development gains for women (Table 6.1).

Policy Innovations and Institutional Responses

Kerala's gender-sensitive development interventions have been both pioneering and sustained. Gender became integral to local-level planning under decentralised governance from 1996 onwards, influencing public investment priorities. The launch of Kudumbashree in 1998 created a community-based network of women's neighbourhood groups under the State Poverty Eradication Mission, which has played a crucial role in empowering women both economically and socially. In 2017, the Government established a separate Department of Women and Child Development by bifurcating the Social Welfare Department, thereby giving focused attention to women's and children's issues. Gender budgeting, introduced during the Eleventh Five-Year Plan, and was systematically expanded by the Thirteenth Plan to institutionalise gender-responsive budgeting across departments.

Together, these initiatives have had transformative effects. They have sensitised Government and society to the gendered impacts of plans and budgets, enhanced women's visibility in public spaces and decision-making, improved female workforce participation, and created enabling environments for women's work. They have also generated innovative responses to gender-based violence and the rehabilitation of survivors.

Gender Priorities for Nava Kerala

To realise the transformative vision of Nava Keralam, several critical gender priorities need to be addressed. The foremost priority is to expand access to productive employment and livelihood opportunities for women and gender-diverse people. This requires an assessment of the gender implications of the emerging knowledge economy and the adoption of measures to reduce the gender wage gap and educated unemployment.

The second priority is to build a robust care economy. Kerala must develop equitable care systems that combine public investment with household-level support, improve women's mobility, and ensure adequate provisioning of care services through gender-responsive infrastructure.

A third priority is to strengthen social protection frameworks, particularly for women working in informal sectors and for those living in disaster-prone areas. Kerala has pioneered several initiatives for women, persons with disabilities, and gender-diverse communities, and these should be expanded and modernised.

Finally, addressing gender-based violence remains fundamental to achieving gender equality. This involves strengthening institutional mechanisms for prevention, ensuring fast-track justice, and providing sustained rehabilitation for survivors.

Employment, Skills, and Entrepreneurship

As per the Periodic Labour Force Surveys, by 2017–18, Kerala and India had comparable female WPRs of 16.4 and 16.5 per cent respectively (urban+rural, all age groups). By 2023–24, Kerala's female WPR rose to 29.5 per cent, up from 20.4 per cent in 2018–19, and among women aged 15–59 years, it reached 39.6 per cent compared to 43.7 per cent at the national level.

Urban women in Kerala consistently show higher participation than their all-India counterparts, reflecting the combined influence of literacy, urbanisation, and the growth of the service sector. Nevertheless, male WPR remains nearly double that of females, with 76.1 per cent compared to 39.6 per cent in 2023–24.

Kerala also performs better than India in the quality of employment for women. In 2018–19, 40 per cent of employed women held regular or salaried jobs, more than twice the national average, while unpaid family work accounted for only 8 per cent compared with India's 31 per cent. However, long-term and secure jobs for women remain limited, and youth participation is low. The female WPR among those aged 15–29 years

Table 6.1 *Selected indicators of literacy, education, and health: India and Kerala*

Education	India	Kerala
Girl children between 2-4 years attending pre-school	40.3	56.3
Women who are literate (%)	71.5	98.3
Women aged 6 years and above who ever attended school (%)	71.2	95.6
Median years of schooling for women (years)	4.9	9
Women with 10 or more years of schooling (%)	41	77
Women who have ever used the internet (%)	33.3	61.1
Share of educated women (highest level of completed education secondary and above) among persons of age 15 years and above (%) (NSS)	32.3	57
Gross attendance ratio, women, higher secondary level (%) (NSS)	65.9	99.2
Gross attendance ratio, women, post-higher secondary level (%) (NSS)	20.7	40.7

Source: NFHS-5, NSS 75th round: Household Social Consumption on Education, 2017-18

Health	India	Kerala
Sex ratio (Census 2011)	943	1084
Birth rate (SRS 2023)	18.4	12.3
Total fertility rate (SRS 2023)	1.9	1.5
Infant mortality rate (SRS 2023)	25	5
Maternal mortality ratio (SRS 2020-22)	88	18
Life expectancy at birth, women, (SRS 2019-23)	72.5	78.4
Institutional births for births 5 years before the survey (%)	88.6	99.8
Women with Body Mass Index (BMI) below normal (BMI <18.5 kg/m^2) (%)	18.7	10.1
Women aged 15-49 years who were anaemic (<12.0 g/dl) (%)	57	36.3
Women aged 20-24 years married before age 18 years (%)	23.3	6.3
Population living in households that use an improved sanitation facility (%)	70.2	98.7
Currently married women who usually participated in household decisions (%)	88.7	94.1
Women having a bank or savings account that they themselves use (%)	78.6	78.5
Women having a mobile phone that they themselves use (%)	54	86.6

Source: Census of India reports; NFHS 5, Sample Registration Survey reports

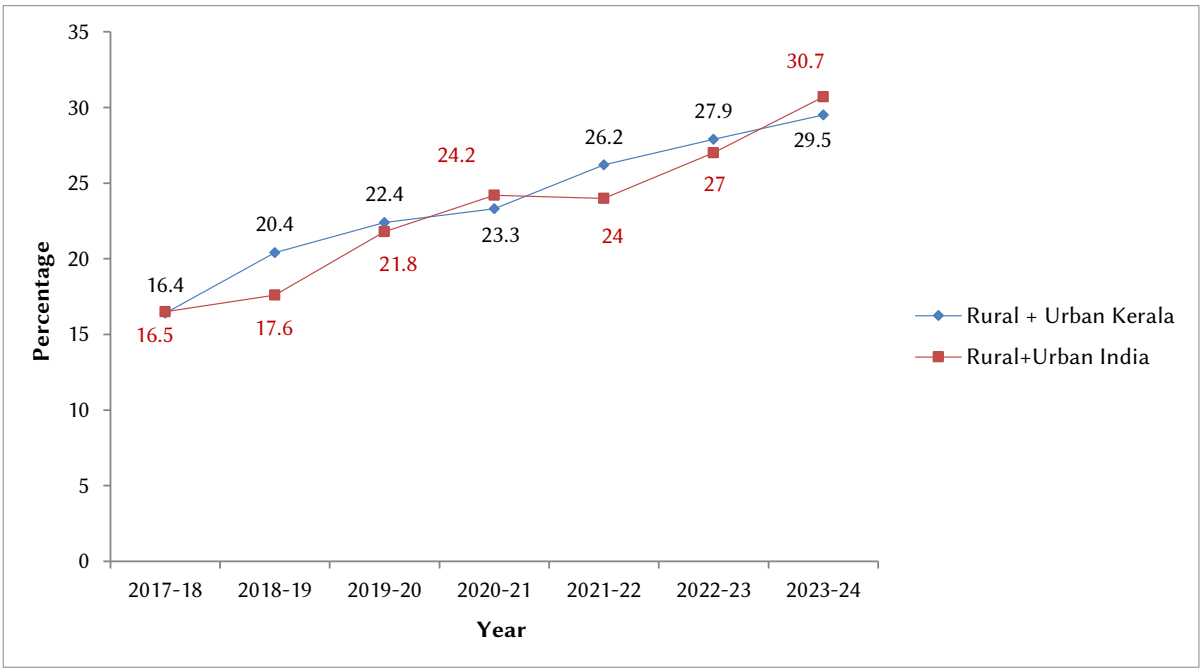

Figure 6.1 *Worker Population Ratio of women, all ages, Kerala and India, 2017-18 to 2023-24*
Source: PLFS, various years

stands at 15.5 per cent, compared with 22 per cent for India, partly because a much higher proportion of young women in Kerala remain enrolled in education- 45.5 per cent compared with 30.3 per cent nationally.

Kerala's female workforce is also more educated, as seen in Table 6.1. More than half of women who have completed higher secondary education or beyond are employed, and this share increased to 54 per cent in 2023–24.

Women now constitute more than 40 per cent of organised sector employment in the State, and are 51 per cent of the employees in the organised private sector. However, the expansion of contractual work and lower levels of social security in private enterprises remain concerns that call for policy attention.

Educated unemployment among women continues to be a challenge. In 2023–24, the unemployment rate among educated women was 11.6 per cent, compared with 4.4 per cent for men. Among postgraduates, it declined from 36.5 per cent in 2019–20 to 23.7 per cent in 2023–24, but the levels remain high. Around 47 lakh educated women are outside the labour force, including those actively seeking work or on career breaks, according to the Kerala Budget 2021–22. The rising number of women registering in employment exchanges shows their willingness to work, even though suitable opportunities remain limited.

Sectoral patterns the continued concentration of women in traditional industries such as coir and cashew, where they form between 80 and 90 per cent of the workforce. Mechanisation and State-supported revival packages have helped sustain employment in these sectors. In agriculture, women's share of the workforce has increased markedly since the pandemic, rising from 20 per cent in 2018–19 to 36 per cent in 2023–24, mainly in allied activities. The service sector now employs about one-third of Kerala's female workforce, particularly in education, health, finance, information technology, and social services, which is far higher than the national average of 11 to 16 per cent.

Another remarkable feature of Kerala's industrial structure has been that despite the overall low female work participation rates, there is a relatively high share of women in a select number of service sector activities, which require higher levels of education and skills. Looking at the period 2018-19 to 2023-24 the combined share of these services which include education, health, social services, information services, financial and insurance, real estate, professional scientific and technical activities, administrative and support services, public administration and arts, accounted for between 30-34 per cent of the female work force while for all India the percentage varies between 11-16 per cent. Data on the IT sector shows that women have increased

Table 6.2 *Distribution of workers in usual status (ps+ss) by broad status of employment, Kerala and India (in brackets), 2018-19 to 2023-24* in per cent

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Total self employed	32.2 (53.4)	37.2 (56.3)	34.7 (58.4)	35.7	37.8 (65.3)	37 (67.4)
Regular/salaried	42.3 (21.9)	39.9 (20.0)	39.6 (20.2)	37.3	40.3 (15.9)	41.2 (15.9)
Casual wage worker	25.5 (24.7)	22.9 (20.7)	35.7 (21.5)	27	21.9 (18.8)	21.7 (16.7)
All workers	100	100	100	100	100	100

Source: PLFS, various years

their numbers in the rapidly expanding sector, and their share in the 3 major IT parks has stabilised at around 40 per cent (IT Department). Growing recruitment in the Police, Excise, and Forest Departments points to a welcome diversification of employment opportunities

Domestic work remains a large but poorly regulated occupation, reflecting entrenched social hierarchies and economic vulnerabilities, as discussed by Sai Devi (2024)[1]. The forthcoming Domestic Workers Bill aims to address this gap.

Migration has also acquired a strong gender dimension. The number of female emigrants from Kerala increased from 1.3 lakh in 1998 to 4.2 lakh in 2023, with destinations now extending beyond the Gulf to Europe, North America, and Australia.

By 2023, according to the Kerala Migration Survey, women accounted for 19.1 per cent of emigrants, up from 14 per cent in 2014, and nearly three-quarters of them possessed degree-level education. The majority are nurses, teachers, or professionals, making Kerala India's largest contributor to the global nursing labour force. Almost 4.2 lakh women emigrate. Female migration has further seen a shift from Gulf Cooperation Council (GCC) countries to Europe and other Western nations as destination countries, accounting for 40.5 per cent. Male migrants continue to dominate emigration from Kerala, but the gap between male and female migrants is narrowing; it is narrowest in Kottayam and widest in Malappuram Districts. Almost 52 per cent of female emigrants are in the category nursing and nursing assistant, followed by engineer, teacher, cashier/clerk/accountant, household worker (maid full time), and doctor, childcare worker, and other occupations. Previously, only about half of the women emigrants moved as workers; however, studies indicate a shift in the reasons for migration towards work and its impact on women's lives.

Yet, return migration among women remains limited, and there is the need for reintegration and welfare mechanisms.

In terms of education, 71.5 per cent of female migrants were found to have completed degree-level education as opposed to only 34.7 per cent of male emigrants.

Further, 54.4 per cent of student emigrants from Kerala are males while 45.6 per cent are females. This shows a narrower gender disparity among student emigrants compared to the overall emigrant population from Kerala, where males comprise over 80 per cent.

Towards a gender-responsive employment ecosystem

Kerala's gender equality agenda has evolved from welfare-oriented interventions to a comprehensive strategy focused on economic empowerment and sustainable livelihoods. Women's employment promotion in the State integrates wage employment, self-employment, and skill-based entrepreneurship, coordinated through multiple departments and missions. The key implementing agencies include the Local Self-Government Department (through Kudumbashree and MGNREGS), the Women and Child Development Department (through the Kerala State Women's Development Corporation), the SC/ST Development Departments, and sectoral Departments such as Fisheries, Tourism, Industries, Labour, and IT. This multi-sectoral synergy makes Kerala a model for gender mainstreaming in employment policy.

[1]Sai Devi, S. (2024). Women and Domestic Work in Urban Kerala.

Wage employment programmes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and the Ayyankali Urban Employment Guarantee Scheme (AUEGS) form the backbone of livelihood protection for women, especially those belonging to poorer sections. AUEGS, introduced in 2009–10, guarantees 100 days of employment to urban households with at least 50 per cent of beneficiaries being women. Its budget allocation increased from Rs 15 crore in 2016–17 to Rs 180 crore in 2025-26. MGNREGS continues to ensure income stability in rural areas, with Kerala recording among the highest number of workdays for SC and ST families in the country, and women accounting for 89–90 per cent of the total person-days. Together, these employment guarantee programmes have become vital instruments of livelihood security, cushioning women against economic shocks and uncertainties.

The Kudumbashree Mission, established in 1998, stands as a globally recognised model for women's collective empowerment. With over 48 lakh members, Kudumbashree has transformed from a poverty alleviation programme into a dynamic network for self-employment and enterprise promotion. Its initiatives span agriculture, microenterprises, microfinance, and social empowerment. In agriculture, about 4.5 lakh women cultivate nearly 24,153 hectares of land through Joint Liability Groups, contributing to food security and rural employment. By November 2025, Kudumbashree had facilitated nearly 1.8 lakh microenterprises involving over 3.4 lakh entrepreneurs. Its flagship projects — such as Amrutham Nutrimix, Kerala Chicken, Prathyasha, coastal and tribal livelihood schemes, and Maa Care Stores — have strengthened women's income sources and economic agency. Kudumbashree has also expanded into the digital economy through initiatives like the Pocketmart mobile app, Kudumbashree Bazaar, and Nano Markets, which connect women entrepreneurs directly to markets and customers. This institutional model demonstrates how collective enterprise and LSG structures can create a pathway from social inclusion to economic empowerment.

Beyond these flagship programmes, several sectoral initiatives have broadened women's employment and livelihood opportunities. In the fisheries sector, Rs 23 crore was allocated in 2022–23 for alternative livelihoods of fisherwomen, resulting in the creation of over 25,000 microenterprises, with women playing a dominant role in mussel farming and inland aquaculture. In tourism, the Responsible Tourism Mission, institutionalised in 2018–19, promotes community-based tourism models that integrate women into local economic activities. The Women-Friendly Tourism Initiative launched in 2025, in partnership with UN Women, trains women as tour guides, drivers, and entrepreneurs, with over 10,700 women registered so far. The industrial sector also reflects women's growing participation, with 32 per cent of the 3.5 lakh registered MSMEs between 2022 and 2025 led by women, creating over 2.2 lakh jobs. Twenty per cent of the budget under the Entrepreneur Support Scheme is earmarked for women, ensuring targeted assistance. Complementing these efforts, the Labour Department's Saranya Scheme provides subsidised loans of Rs 50,000 for widows, divorced, and single women, while the Social Justice Department supports BPL and women with disabilities through schemes such as Swasraya and Ashwasam. Cooperative institutions, too, have promoted collective women-led ventures; there are now 1,245 Vanitha Co-operatives, with Rs 7.5 crore allocated in 2024–25 to support technology-driven agricultural cooperatives.

Targeted interventions by welfare Departments have also ensured that marginalised women are not excluded from the benefits of development. The SC, ST, OBC, and Minority Departments run entrepreneurship and training programmes that have seen consistent increases in budget allocations- Rs 55 crore for Scheduled Castes and Rs 9 crore for Scheduled Tribes in 2024–25. Programmes such as TRACE and the Apprenticeship Training Scheme support start-ups, placements, and professional development for the youth from these communities. Such measures underscore the State's commitment to intersectional equality and inclusive development.

The Women and Child Development Department, through the Kerala State Women's Development Corporation (KSWDC), has been a key agency in promoting women's access to finance, skill development, and entrepreneurship. Between 2016 and 2025, KSWDC disbursed Rs 1,504.8 crore to 1.7 lakh beneficiaries, including marginalised and transgender entrepreneurs. Its Entrepreneurship Development Programmes and the ESCALERA Expo have enhanced women's visibility in markets, while its Project Consultancy Wing provides professional guidance in project preparation, business planning, and incubation support. These initiatives have strengthened women's

confidence and capacity to transition from informal livelihoods to structured enterprises.

Kerala has also taken significant strides in integrating women into science, technology, and innovation. The Kerala Start-up Mission (KSUM) has allocated Rs 2.5 crore in 2024–25 to support 500 women innovators, and since 2019, 99 women-led start-ups have been launched across sectors such as agriculture, life sciences, and climate technology. Institutions such as ICFOSS and the Digital University promote women's digital literacy, incubation, and hackathon participation, while the Kerala State Council for Science, Technology and Environment (KSCSTE) has launched the Support to Women in Science programme to strengthen women's participation in research and innovation. The WESAT project — the first women-engineered satellite in India — symbolises this shift towards integrating women into high-end technology sectors.

Kerala's transition to a Knowledge Economy: innovation, inclusion, and women's employment

Kerala's development trajectory has increasingly moved towards building a knowledge-based economy that integrates innovation, skill development, and inclusive employment creation. The Kerala Development and Innovation Strategic Council (K-DISC) and the Kerala Knowledge Economy Mission (KKEM) form the two institutional pillars driving this transition, ensuring that technological innovation and human capital development are directed towards sustainable and equitable growth.

The Kerala Development and Innovation Strategic Council (K-DISC) serves as the State's apex innovation agency, entrusted with fostering a holistic innovation ecosystem. Inclusivity remains central to its design — special efforts have been made to involve women, SC/ST groups, minorities, and persons with disabilities in innovation-driven programmes.

Among its notable gender-focused initiatives, the 10,000 Women Back to Career Programme launched in 2024 supports women returning to work after career breaks. The programme provides training, mentoring, and placement assistance, reflecting a shift towards gender-sensitive innovation in employment generation.

The Kerala Knowledge Economy Mission (KKEM), implemented by K-DISC, is the State's flagship initiative to expand gainful employment through knowledge-based opportunities and digital workforce management. Its primary goal is to connect job seekers and employers through the Digital Workforce Management System (DWMS), a unified platform offering curated skilling, counselling, and placement support. The Mission focuses on demand-side management and employs data-driven approaches to align skills with labour market needs, both domestically and internationally.

As of October 2025, KKEM had registered over 20.6 lakh job seekers and 8,239 employers, mobilised 33.7 lakh vacancies, and facilitated employment for 6.7 lakh individuals, including 60,097 direct placements. Registered job seekers include 11,69,851 females and 593 transgender persons. Special mechanisms through LSGs and educational institutions have been developed to reach women with career breaks, SC/ST groups, fisherfolk, transgender persons, and other vulnerable sections. Career fairs, roadshows, and the Recruit-Train-Deploy model are used to ensure meaningful and industry-relevant employment outcomes.

The Thozhilaragathek Initiative under KKEM demonstrates the Mission's gender-inclusive focus. It provides comprehensive support to women — from job search to placement — through diverse interventions. These include skilling for women in the film industry (in collaboration with the Chalachitra Academy), virtual job drives, special projects for single women (with AIDWA), entrepreneurship development (with KSWDC), employability training (with the Naandi Foundation), and Empower, a professional readiness programme for young women that builds leadership, financial literacy, and communication skills. Digital design training programmes launched in partnership with Kochi Corporation have attracted strong participation from women, demonstrating growing interest in creative digital sectors.

ASAP's contribution through KKEM-funded initiatives

Under KKEM, the Additional Skill Acquisition Programme (ASAP) has implemented two major skilling initiatives — the KKEM Scholarship Scheme and the Work Readiness Programme — aimed at improving the employability of Kerala's youth. The Scholarship Scheme, with an allocation of Rs 6 crore, supported 2,674 candidates in high-demand technology domains such as AI and ML, Business Analytics, Python, Cyber Security, Web and UI Development, and Digital Marketing. The Work Readiness Programme, a 15-hour soft skills and job readiness intervention, benefitted 52,251 candidates. Altogether, 54,925 students were supported, of whom 55 per cent were women- a significant indicator of progress in encouraging women's participation in STEM and knowledge economy sectors.

The high enrolment of women in these programmes reflects the success of Kerala's sustained policy efforts to integrate women into technology and innovation-driven fields. As education levels rise, women are increasingly participating in sectors such as IT, health, education, finance, and legal services- core components of the knowledge economy. The key challenge now is to translate this participation into upward occupational mobility and leadership opportunities within these sectors.

Kerala's experience shows that a gender-responsive employment policy must combine livelihood security with enterprise development and technological inclusion. While employment guarantee schemes have safeguarded vulnerable women, programmes like Kudumbashree and KSWDC have created platforms for self-employment and entrepreneurship. Sectoral initiatives in tourism, fisheries, and IT demonstrate how gender-sensitive design can open pathways in non-traditional and knowledge-based sectors. However, challenges remain in achieving convergence between Departments, scaling up microenterprises, aligning skill development with emerging job markets, and strengthening social protection for women in informal sectors.

A coordinated approach that links skills, credit, technology, and markets is essential to transform women's work from a survival-oriented activity to sustainable, growth-oriented entrepreneurship. Kerala's policy trajectory offers valuable lessons on how gender equality can be embedded in the state's economic agenda- not merely as a social goal but as a foundation for inclusive and resilient development.

Social Protection Initiatives for Vulnerable Women in Kerala

Kerala's social policy framework has progressively expanded to include a wide range of targeted interventions for women in vulnerable circumstances-widows, women-headed households, women with disabilities, single mothers, and those affected by disasters and climate change. The combined efforts of the Departments of Women and Child Development (WCD), Social Justice (SJD), Kerala Social Security Mission (KSSM), and allied agencies demonstrate a comprehensive approach that integrates welfare support, livelihood promotion, education, and resilience-building.

Shelter and livelihood support for vulnerable women

The Abhayakiranam scheme (WCD), operational since 2017–18, provides shelter and protection to destitute widows through a modest monthly assistance of Rs 1,000 to relatives who house them. Over the years, more than 700 beneficiaries have been supported annually, though allocations show minor fluctuations. Complementing this, Sahayahastham (Helping Hand) extends one-time assistance of Rs 30,000 to economically underprivileged widows under 55 years of age to promote self-employment. Despite variable funding patterns, the initiative represents an important step towards economic reintegration of widowed women. The Athijeevika scheme provides emergency financial assistance of up to Rs 50,000 for families headed by women survivors of crises, while the Snehasparsham programme offers a monthly pension of Rs 2,000 to unwed mothers, addressing both financial and psychosocial needs. Similarly, the Mathrujyothi project under the Social Justice Department provides postnatal financial assistance to mothers with disabilities, showing steady progress since its inception in 2017–18, and supporting around 80 women annually.

Educational assistance to children in vulnerable families

Several schemes focus on breaking intergenerational cycles of vulnerability through education. Padavukal (Steps) supports the higher education of children of widowed women pursuing professional courses by meeting tuition and hostel expenses. The scheme, launched in 2018–19, saw a significant expansion in 2021–22, benefiting 300 students. Similarly, Snehapoorvam (KSSM) provides educational aid to orphans and children with single parents or HIV/AIDS-affected parents, with a Rs 20 crore allocation in 2024–25. The Vidyadhanam scheme targets children of women-headed and BPL families, including those abandoned, divorced, widowed, or with disabled spouses. Between 2018–19 and 2024–25, it assisted over 1,700 children annually, addressing the educational vulnerability caused by illness or accidents that incapacitate earning male members. The Vidyakiranam project (SJD), which supports children of parents with disabilities, continues to reach more than 4,000–6,000 beneficiaries each year, thanks to a steady financial commitment, ensuring educational continuity for children in families with high dependency burdens.

Rehabilitation and marriage assistance

Social justice interventions extend to supporting marriage and family rehabilitation. The Parinayam Project assists in the lawful marriage of daughters of persons with disabilities or women with disabilities

themselves. Since 2017-18, the scheme has benefited over 1,000 women annually in peak years, reflecting both financial need and effective outreach. The Mangalya scheme provides Rs 25,000 for remarriage of widows and legally divorced women aged 18–50 years. The scheme has shown consistent implementation, supporting around 200 women annually. Parallel provisions by the SC/ST Development Departments allocate substantial funds Rs 86 crore for SC girls and Rs 6 crore for ST girls in 2024–25 providing up to Rs 1.5 lakh per beneficiary, with higher assistance for orphans and daughters of incapacitated parents. Smaller but symbolic initiatives such as the Marriage Assistance Scheme for Daughters of Prisoners also address the social stigma faced by marginalised families.

Social protection and gender-responsive climate resilience

Kerala's experience with recurrent floods (2018, 2019) and the catastrophic Wayanad landslides of July 2024 underscore the necessity of gender-sensitive disaster preparedness and climate resilience policies. Global evidence shows that women's vulnerability to disasters is shaped not only by biology but by systemic inequities in access to resources, decision-making, and information. Ensuring gender-responsive social protection in climate adaptation — through livelihood restoration, access to credit, housing, water, sanitation, and healthcare — is critical for strengthening women's resilience and adaptive capacity.

Institutional efforts and local governance. The Local Self-Government Department has initiated the preparation of Local Action Plans for Climate Change (LAPCC) across 217 Gram Panchayats under the Rebuild Kerala Initiative (RKI) with an annual outlay exceeding Rs 1,500 crore since 2019–20. RKI integrates disaster risk reduction and climate resilience into development planning, though explicit gender mainstreaming remains limited. Tools such as KILA's Disaster Risk Reduction and Climate Action Tracker (DCAT) are being used to capacitate LSGs, and ensuring women's active participation in such training and monitoring is vital for inclusive resilience-building.

An innovative example of gender-responsive climate action was the participatory project undertaken in three coastal Panchayats of Ernakulam by the Tata Institute of Social Sciences (TISS), in collaboration with the LSGD, MS Swaminathan Foundation, Equinoct, and Kudumbashree. This initiative empowered local communities — especially women — to document and respond to high-tide flooding through community-owned data, participatory mapping, and social learning. Kudumbashree women played a central role in data collection, resource mapping, and analysing time-use poverty during disasters. The model demonstrated how women's local knowledge and collective organisation can transform them from "victims" to active agents of climate resilience and adaptive governance.

Addressing Gender-Based Violence in Kerala

A coordinated, multi-sectoral response to address Gender-Based Violence (GBV) is needed that combines legal reform with social transformation. Strengthening institutional mechanisms, improving data systems, ensuring accountability of redressal bodies, and promoting gender sensitisation across institutions are essential to curb GBV and create safer, more equitable spaces for women in Kerala.

Departmental initiatives to address gender-based violence in Kerala

Kerala has developed a multi-tiered approach combining prevention, awareness, institutional capacity building, helplines, and rehabilitation services. Initiatives by various departments are listed below.

Directorate of Women and Child Development (WCD). Initiatives include flagship programmes such as Gender Awareness (since 2006) and Sadhairyam Munnottu which target Government officials, field staff, and citizens to sensitise them on gender issues; the anti-dowry campaign launched in 2019–20 to eliminate dowry within five years, via social media and outreach programmes; Mitra 181 which provides 24/7 support, handling over 2.5 lakh cases; Women Cells in colleges (100 colleges, 20,000 students) to promote gender equality; the Bodhyam programme which trains police personnel on gender-responsive practices (over 10,000 trained); community engagement including training by the Kerala Women's Commission for Jagrata Samithi members to prevent crime, and conducts awareness programmes for youth; Kudumbashree initiatives such as the Gender Self-Learning Programme (GSLP) and Sthreepakshanavakeralam which trains women in NHGs on gender issues, employment, health, mobility, and violence prevention, covering hundreds of thousands of women.

Police Department. Gender sensitisation programmes, specialised Pink Police units, and online grievance mechanisms (Aparajitha) enhance safety for women in public spaces.

Education initiatives. Naithikam textbook module (2019–20) and comprehensive gender review of school

textbooks (2022 onwards) which aims to instill gender awareness from childhood; Vanitha Mathil (2019) and Pothu Idam Entethum (2019) are innovative societal awareness campaigns promoting women's rights and safe public spaces.

Redressal and rehabilitation. Nirbhaya Policy and Nirbhaya Cell. Focus on preventing sexual crimes and providing rehabilitation via 14 women and children homes, including specialised facilities like Tejomaya Home and Model Home in Trichur; 83 service centres and 14 shelter homes offering legal, medical, vocational, and counseling support under the Unarvvu programme; **c**orpus fund (Rs 3–10 crore) under the Aswasanidhi scheme which provides interim relief to victims of gender-based violence; martial arts training for adolescent girls through the Dheera project; Sakhi One-Stop Centres and Kathorthu project which provide integrated services and online counseling/legal aid for women in distress.

Health Department. Bhoomika centres (21 in Kerala) provide medical and psychological care for victims; Seethalayam offers similar services under the Homeopathy Directorate.

Law Department. 56 fast-track POCSO courts have been established, and case disposal rates have improved from 10.6 per cent in 2020 to over 112 per cent in 2025 (as of May); District-level data on protection orders, pending cases, and service utilisation helps track domestic violence cases.

Transgender Persons in Kerala

A 2014 socio-economic survey by the Social Justice Department on transgender persons in Kerala showed gaps in access to income, education, health services, and safe social spaces. Alarmingly, 19 per cent had attempted suicide in the preceding year, and 41 per cent had experienced violence. Barriers include lack of awareness among service providers about gender diversity, social stigma, and inadequate access to healthcare for both general and gender-affirming needs.

The Supreme Court of India, in its 2014 judgment, affirmed the rights of transgender persons to equality, dignity, and protection under the law. Building on this, Kerala became the first Indian state to adopt a Transgender Persons Policy in 2015, emphasising self-identification, equality, and access to fundamental rights.

Kerala has set a benchmark in India for transgender-inclusive policies. The State demonstrates progressive commitment through legal recognition, healthcare support, educational opportunities, employment initiatives, and social protection. To ensure full equality and dignity, continuous investment, robust monitoring, and societal sensitisation are essential.

Government initiatives

There are numerous initiatives including State and District-level Transgender Justice Boards for registration and ID issuance (established 2016–17); the Mazhavillu Umbrella Scheme which consolidates various TG initiatives, including scholarships, livelihood workshops, and housing support; financial assistance for Sex Reassignment Surgery (SRS) and post-operative care with significant increases in beneficiaries between 2018–2022; Varnam/Safalam project for distance learning, scholarships, and hostel facilities to ensure safe access to education; Karuthal project for financial assistance of transgender couples, and for individuals in emergencies; and community programmes including workshops, helplines, sensitisation campaigns, and plans for transgender-friendly public facilities.

There are also employment initiatives such as the KSWDC TG Self-Employment Loan Scheme for financial and assistance and skill support for MSMEs, and support to establish employment-generating MSMEs.

Violence prevention and support for transgender people in the State, sensitisation programmes for families, schools, health, and police staff, 24/7 Transgender Helpline and crisis management services, advocacy, and awareness campaigns using social media are also initiated by the Department of Social Justice

Progress and impact

Kerala has made significant strides in supporting transgender persons through legislation, policy, and financial allocation. Programmes such as SRS, scholarships, and hostel facilities have improved access to education, healthcare, and employment. Despite these initiatives, persistent social stigma, low service uptake, and safety concerns continue to limit full social inclusion.

Kerala's Gender Budgeting: Key Highlights

Kerala has been a pioneer in mainstreaming gender budgeting into its annual planning and budget processes, ensuring that public resources are effectively directed toward improving the well-being, livelihood, and empowerment of women, children, and transgender persons. By integrating gender concerns across sectors, the State has achieved better outcomes in both traditional and non-traditional development programmes. Kerala's gender budgeting demonstrates a sustained

commitment to gender equality, empowerment, and social justice, effectively linking financial allocations to measurable social outcomes while maintaining flexibility to improve and redesign programs based on performance evidence.

Key features

Gender-responsive budgeting. Gender assessments guide resource allocation across departments, enhancing both policy impact and efficiency.

Cross-agency collaboration. Coordination between the State Planning Board, Finance Department, and all Government Departments ensures gender perspectives are integrated in programme design and delivery.

Institutionalisation. Gender budgeting is stabilised and mainstreamed, with allocations steadily increasing across sectors despite fiscal challenges.

Pre-Budget reviews. The State Planning Board conducts comprehensive pre-Budget discussions with Departments, supporting informed and gender-sensitive planning.

Gender Budget 2025–26 overview

The total Gender Budget allocation in 2025-26 represented 20.79 per cent of the total Plan outlay. Women-specific schemes were 10.83 per cent of Part A of the budget, and 9.96 per cent of Part B were partially women-focused schemes. Overall, financial allocations for gender-specific programmes have increased, reflecting continued commitment to social security and gender justice.

The schemes include initiatives to strengthen women's safety and gender mainstreaming, programmes to enhance women's employability and entrepreneurial opportunities, schemes to ensure healthcare, pensions, and social protection for vulnerable women, and investments to create safer and more inclusive public spaces and facilities.

The State Planning Board has conducted a review of all schemes to assess implementation, impact, and feasibility. Some schemes have been expanded, some redesigned, and others discontinued based on departmental feedback.

Way Forward

The Government of Kerala places the expansion of quality employment opportunities for women at the centre of its policy agenda. The State now prioritises women's participation in high-growth sectors such as the knowledge economy, digital enterprises, care services, and green industries. Skill development is, of course, clearly linked to formal sector employment.

Government policy will address issues of women's work participation by addressing issues of equal pay, safe working conditions, and gender audits in enterprises.

The State invests in care infrastructure by developing public systems for childcare, eldercare, and disability support, and by encouraging a fair sharing of household responsibilities. Social protection must expand by means of wider access to health, housing and pensions to informal-sector workers, and through the integration of gender concerns into disaster resilience programmes. Efforts to prevent gender-based violence continue through large-scale awareness campaigns, strengthened fast-track justice mechanisms, and sustained rehabilitation programmes for survivors.

Kerala also harnesses opportunities in the knowledge economy by strengthening digital skills, entrepreneurship, and innovation ecosystems through initiatives such as K-DISC. Efforts are being made to create re-entry pathways for professional women who have taken career breaks. Gender disaggregated data systems shall be improved to support effective planning, monitoring, and evaluation of all gender-related programmes.

Chapter 7

Child Development and Protection: Ensuring Rights, Well-Being, and a Future for Every Child

The guiding principle of the policy of the Government of Kerala with respect to child development is a rights-based approach based on the principles stated in the United Nations Convention on the Rights of the Child (UNCRC). Child development is the concern of multiple spheres of State activity, including maternal and child health services, access to housing and modern domestic facilities, early childhood care and education, child protection and alternative care and support, social inclusion, mental health and psychosocial development, recreation, the development of children as citizens of a secular, democratic society, and other aspects of a child's needs in the world.

The Government of Kerala ensures child-friendly schools and baby-friendly hospitals in partnerships with various agencies. The State's methods conform to national legislation, including the Juvenile Justice Act, POCSO Act, and the Right to Education Act. Kerala has instituted the State Policy for Children, and the Kerala State Commission for Protection of Child Rights supervises its implementation.

In addition to District Child Protection Units and Child Welfare Committees, Kerala has instituted child-friendly courtrooms, POCSO fast-track courts, and strict childcare regulations. Accountability is ensured through annual social audits and performance reviews. Child protection efforts are strengthened through inter-sectoral and collaborative health, education, and law enforcement initiatives.

Status of Children in Kerala: A Demographic and Developmental Overview

Kerala demonstrates exemplary child development indicators through progressive policies and equitable service delivery. The State's demographic advantages, robust healthcare, and inclusive education systems create an enabling environment for children's holistic growth.

Demographic indicators

Kerala possesses favorable demographic characteristics that support child development with a birth rate of 12.3/1,000 which is lower than the national average of 18.4/1,000, and a sex ratio of 1084 females per 1,000 males compared to the national average of 943. The child population (0–18 years) constitutes 26.3 per cent of the total population, projected to reach 3.5 crore by 2025, while the fertility rate has declined to 1.5 children per woman, below replacement level, pointing to smaller family sizes and higher investment in each child's health and education. (Office of the Registrar General and Census Commissioner, India, 2022). As per the 2011 Census, 47.7 per cent of Kerala's population resides in urban areas, reflecting significant urbanisation, but decentralised initiatives in the State ensure that rural children also benefit from quality healthcare, near-universal immunisation, nutrition, and early education, with 234 out of 258 ICDS projects functioning in rural areas.

Survival and health

Kerala demonstrates outstanding child health outcomes in India. The State has low child mortality rates and improved nutrition indicators. Robust healthcare infrastructure, comprehensive immunisation coverage and effective preventive care systems make this possible.

Kerala has made notable progress in addressing malnutrition, as indicated in NFHS 5. The rate of children under 5 years who are stunted is 23.4 per cent, compared to the national average of 35.5 per cent. The State reports a rate of 15.8 per cent of children under 5 years who are wasted, in contrast to the national rate of 19.3 per cent, and an underweight prevalence of 19.7 per cent compared to a national figure of 32.1 per cent. Childhood anaemia impacts 39.4 per cent of children fewer than five years, significantly lower than the national rate of 67.1 per cent.

The State's strong healthcare infrastructure and preventive strategy have produced significant immunisation and disease prevention outcomes. According to the Directorate of Health Services, Kerala achieved a full vaccination coverage rate of 94.28 per cent for children aged 12 to 23 months, marking a significant increase from 69.7 per cent in 2015-16 and surpassing national benchmarks. The healthcare system manages common childhood illnesses through early detection, oral rehydration therapy, and prompt medical intervention, thereby reducing the prevalence of diarrhea and acute respiratory infections. Integrating community-based nutrition initiatives with routine immunisation programmes and robust primary healthcare systems, Kerala has become a leader in child health outcomes in India (James et al., 2021).

Education and early childhood development

Kerala's education system is a national model with nearly universal enrolment, high learning outcomes, and good retention. Gender equity in education, combined with digital programmes like KITE and Hi-Tech Schools, ensure that all the State's residents have access to high-quality education.

As per the ASER report, 2024, Kerala outperforms other States and the national average in most of the indicators related to quality and accessibility of education. Kerala employs qualified teachers and has effective monitoring mechanisms. (See Chapter 3 on School Education in this report for additional details).

Disability and early detection

Kerala has a number of initiatives for early detection and support for individuals with disability. Initiatives like Rashtriya Bal Swasthya Karyakram (RBSK) and ANUYATRA facilitate screening in schools, anganwadis, and healthcare institutions. District Early Intervention Centres (DEICs) and specialised projects like universal newborn hearing screening enable timely diagnosis at birth. These initiatives provide necessary therapy and interventions, thus improving the quality of life of children with disabilities.

Major Schemes and Programmes across Departments

Kerala's health and nutrition programmes for children

Kerala has a holistic approach to ensuring the health and well-being of its children. These initiatives are inclusive, universal, targeted, rights-based, and responsive to children with varied needs and their families, and emphasise the life cycle approach, early intervention, and convergence of services. The State has integrated health and nutrition initiatives across departments to establish a comprehensive child growth and protection safety net.

Specialised healthcare infrastructure is a pillar of Kerala's child health system. Women and Children Hospitals provide maternity and child health services, including immunisation and infertility clinics. They currently operate in the Districts of Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Palakkad, Kozhikode, Malappuram, and Kannur, with expansion underway in the remaining seven. The 2025-26 Budget supports ongoing civil works, strengthening existing hospitals, and establishing modern infertility clinics with advanced laboratory facilities in a phased manner.

Maternal and Child Health Units in medical colleges work to enhance and standardise amenities in mother and child health departments

Early detection and prevention programmes. Kerala has established comprehensive early detection systems. The Newborn Screening Programme enables early detection of congenital disorders such as hypothyroidism, adrenal hyperplasia, G6PD deficiency, and galactosemia. Screening is carried out in newborns in all hospitals with child delivery services, enabling timely intervention and management that can prevent lifelong complications.

School Health and wellness programme. This comprehensive programme operates in Government and aided schools in the State, and features weekly health awareness sessions by Health and Wellness Ambassadors, universal screenings, electronic health records, and first aid training. RBSK nurses perform regular screenings and referrals for 60 lakh children in 16,240 schools. This is done in stages and funded by the Union and State Governments. Specialised screening initiatives include the Drishti scheme, currently implemented in Kottayam, Ernakulam, Thrissur, Idukki, Malappuram, Kozhikode, Kollam, Alappuzha, and Pathanamthitta Districts. The programme aims to identify refractive errors in school children and provide counselling, treatment awareness, and essential medications and equipment to promptly address concerns of vision.

Treatment programmes for specific ailments. Kerala has developed targeted treatment programmes for various severe health conditions affecting children. The Thalolam programme provides free medical care to children under 18 who have serious ailments such as heart and kidney problems, haemophilia, cerebral palsy, thalassaemia, sickle cell anaemia, and surgery after accidents. It ensures long-term, otherwise expensive therapy for children. Cancer Suraksha initiatives provide free cancer treatment for children under 18 living in underprivileged communities, ensuring that financial constraints do not obstruct access to essential medical care. The Mittayi Social Support Scheme targets children with juvenile diabetes. The scheme provides free insulin, medical equipment, and comprehensive care through early detection, treatment, and monitoring for children with Type 1 Diabetes through Mittayi clinics at five Government medical colleges. The Paediatric Cochlear Implantation programme (Sruthi Tharangam) recognises the importance of early intervention for children with hearing difficulties. This initiative supports rehabilitation and integration into society

by funding cochlear implant surgeries at designated hospitals, addressing a critical sensory disability that can significantly impact a child's development and future opportunities.

Universal healthcare coverage and support services. Kerala's approach to child healthcare emphasises universal access through programs like Arogya Kiranam, which finances medical expenses for all children under 18 years for conditions not covered by the Rashtriya Bal Swasthya Karyakram (RBSK), including accident cases. The Child Development Centre (CDC) serves as a primary referral and training facility to prevent developmental issues. It offers substantial early childhood, adolescent, premarital, and women's health support. A State-wide hub for professional child development services is established with resources for infrastructure, equipment, research, training, and specialty clinics.

Comprehensive nutrition and development programmes. The Integrated Child Development Services (ICDS) programme is the most extensive national programme for children under six. ICDS also supports pregnant women, nursing mothers, and adolescent girls. In Kerala, ICDS functions via 33,120 Anganwadi Centres, delivering supplementary nutrition, immunisation, health check-ups, referral services, health and nutrition education, and preschool education. The programme includes administrative costs, medical kits, weighing scales, educational materials, training, and the improvement of mini anganwadis. Through the Supplementary Nutrition Programme (SNP), children aged 6-72 months receive 500 calories and 12-15 grams of protein; severely underweight children receive 800 calories and 20-25 grams; pregnant and nursing mothers receive 600 calories and 18-20 grams. Since 2005-06, the State has provided extra nutrition with central support to help children and mothers grow and thrive. The First 1000 Days Programme for infants is designed to reduce mother and baby mortality by offering pre-conception consultation, nutrition help, breastfeeding support, and complementary feeding until a child's second birthday. New ICDS projects in coastal, tribal, and hilly areas of Kerala, including food fortification and monitoring, are expanding the effective programme to reach all geographical areas.

The Government of Kerala has introduced eggs or milk to the Anganawadi menus, on all days of the week. This is recognised as a best practice in ensuring nutrition security for children.

Kerala holds the distinction of being the first Indian State to implement the Mid-Day Meal Programme within the school sector, primarily targeting the 6 to 14 age group. Nearly 25 lakh children benefit from this scheme.

Kerala employs advanced monitoring systems to ensure programme effectiveness and evidence-based decision-making. The National Nutrition Mission (POSHAN Abhiyaan) intends to enhance women's and children's nutrition through real-time monitoring and coordinated departmental action. State Nutritional and Diet Related Intervention Programmes assist monitoring efforts with tribal nutrition programmes, research, capacity-building, awareness campaigns, and nutrition-related days.

Kerala's child protection and safety initiatives

The State's innovative programmes ensure protection, rehabilitation and justice for vulnerable children through strong institutional frameworks and grassroots participation.

Child protection under the Juvenile Justice Act. Kerala implements comprehensive safeguards for vulnerable children through institutional care, adoption reforms, and community rehabilitation under the Juvenile Justice Act. The system prioritises prevention, timely intervention, and holistic support. The Integrated Child Protection Scheme (ICPS) in Kerala implements the Juvenile Justice (Care and Protection of Children) Act of 2015 and provides a structured safety net for vulnerable children. It supports family-based alternatives, strengthens adoption frameworks, and coordinates care and rehabilitation for children in need of care and protection and those in conflict with the law.

Kerala operates a comprehensive network of Child Care Institutions (CCIs) under the Juvenile Justice (Care and Protection) Act, 2015, serving Children in Need of Care and Protection and Children in Conflict with the Law. The State maintains 439 registered CCIs across all 14 Districts, demonstrating robust institutional coverage with an average of 31 institutions per District as on November 2025.

The Government operates 30 specialised facilities, including 16 Children's Homes (12 for boys, 4 for girls), 8 Observation Homes, 2 Special Homes, 1 Place of Safety, and 3 Aftercare Homes. This infrastructure ensures comprehensive care across different age groups and circumstances, particularly concerning gender-specific needs and rehabilitation requirements. As of

December 2024, Kerala's CCIs (including the POCSO-specific homes) house 9,743 children (3,429 boys and 3,991 girls, plus 2,324 in foster care), indicating strong gender-inclusive admission practices. The institutions serve 268 children with intellectual disabilities and 93 children with physical disabilities.

The foster care initiative in Kerala provides financial and psychosocial assistance to families who care for children lacking parental support. Kerala emphasises enhancing legal transparency and stakeholder awareness in the adoption system. Community-driven models such as Balasabha, facilitated by Kudumbashree, consisting of networks of children's collectives at LSG-level, promote the active participation of children in civic spaces. Kerala's Jagratha Samithi, consisting of local citizens, actively identifies violations of women's and children's rights, and facilitates prompt intervention in collaboration with statutory authorities.

Kerala's District Child Protection Units (DCPUs) function across all Districts as critical nodes in the child protection network. These units utilise digital case management platforms to facilitate real-time coordination among Child Welfare Committees (CWCs), Juvenile Justice Boards (JJBs), and Special Kerala Police Units (SJPUs). They oversee adoption processes, provide legal and emotional support to children in conflict with the law, and facilitate rehabilitation programmes.

Specialised interventions for diverse vulnerabilities. Recognising the varied risks children face, the State has launched targeted programmes, including Karuthal, which offers bio-psycho-social support to at-risk children and survivors of sexual abuse. Saranabaalyam addresses the needs of children engaged in labour, trafficked, or living on the streets. Bheri monitors cases of child abuse and implements timely interventions. The Juvenile Justice Fund is allocated to support rehabilitation initiatives, particularly for children with disabilities and those from marginalised backgrounds. This fund is distinguished by its acceptance of public contributions and promotion of community ownership of child protection responsibilities.

Special Juvenile Police Units in Kerala stress rehabilitation over punishment. Police receive training in child psychology and law. Kerala's Child Welfare Committees and Juvenile Justice Boards provide children with procedural justice and legal aid. Meanwhile, child-friendly police stations provide safe, non-intimidating environments to facilitate trauma-informed engagement.

Child protection under the POCSO Act. Kerala has 56 fast track special courts to handle sensitive sexual abuse matters under the POCSO Act. These courts have dedicated facilities and staff for faster and child-friendly trials.

The Women and Child development Department's Nirbhaya Cell runs 14 Nirbhaya/Entry Homes for survivors of sexual violence for safeguarding and recovery. Model Women and Children's Home provides complete support for these children. The Thejomaya home in Edakkattuvayal, Ernakulam, gives skill development, vocational training and social reintegration. Additionally, there are 3 SOS Model Homes for children under 12, and specialty facilities.

Kerala has strong initiatives at the school and community-level to combat cyber bullying, online grooming, and Child Sexual Abuse Material (CSAM). Teachers, police, and child protection officers are trained by the State Cyber Cell of the Police Department to identify and respond to internet exploitation.

Emergency reaction relies on Childline 1098 for rescue, counselling, medical, and legal help. Digital dashboards provide quick follow-ups and coordinated care across institutions in this 24/7 service integrated with District Child Protection Units (DCPU), police and NGOs.

Child Protection Committees operate at three LSG levels. These Committees monitor and address child marriage, abuse and child labour. WhatsApp groups and online platforms have made case tracking and resource coordination more responsive and transparent- an innovative approach to digitally enable local governance. Schools in Kerala are mandated to form Child Protection Committees involving students, parents, and teachers. These Committees address the concerns of abuse, bullying, and caste/gender discrimination. To promote child rights and prevent child abuse, State-wide awareness campaigns target teachers, parents, and community leaders.

Public participation, governance, and innovation. The Kerala State Commission for Protection of Child Rights (KeSCPCR) is the highest statutory body in the State that oversees the implementation of child right legislation, investigates infractions, and advises policy. The Commission promotes inter-departmental coordination. Real-time digital systems improve oversight.

Kerala's adoption processes are coordinated by the State Adoption Resource Agency (SARA). The State trains all actors — from judges to families — through capacity-building and legislative standardisation, for an

ethical, transparent adoption processes. Kerala's Juvenile Justice Fund, open to donations and sponsorships, fosters child welfare responsibilities. These contributions help to rehabilitate children with disabilities, economic hardship, or abuse. Awareness initiatives equip teachers, ASHA workers, law enforcement agencies, social workers, and community leaders with imparting the skills to identify risk factors and respond sensitively.

The Anganwadi-cum-Creche Scheme supports 504 centres across the State when its implementation is complete. These creches will serve working mothers by providing holistic care that nurtures nutrition, early learning, and emotional development during the critical 0–6 age window.

Kerala's multi-layered, decentralised, and digitally connected child protection architecture is exceptional. For every child's safety, dignity, and long-term care, the system seeks judicial reform, digital innovation, community participation, and psychosocial rehabilitation.

Mental health and well-being

Kerala has developed a comprehensive, multi-tiered mental health framework for children and adolescents, integrating universal, selective, and indicated prevention strategies across education, health, social justice, and local governance sectors. The State prioritises early identification and intervention through school-based programmes spanning primary to higher secondary levels. Mental health awareness is embedded within the regular curriculum and teacher training, creating a sustainable support ecosystem that emphasises community and family-based care over institutionalisation.

Mental health services address academic stress, behavioural issues, substance abuse, digital addiction, and suicidal ideation. IMHANS and District Mental Health Programmes coordinate prevention and treatment services across all school districts. Professional counselling centres, crisis hotlines, tele-therapy, and culturally responsive services enhance accessibility. Kerala's youth suicide prevention strategy includes tele-counselling crisis helplines and community-based support, aligned with the State's commitment to a Zero Suicide goal among youth aged 15–25.

Early identification mechanisms include teacher training, school assessments, and psychosocial curriculum integration through programmes such as Sauhruda Clubs, Kriyatmaka Kaumaram, and Karuthum Karuthalum, which focus on resilience and life skills development. Life skills education is further strengthened through Ullasaparavaakal, SCERT's structured programme covering self-awareness, emotional regulation, decision-making, empathy, and communication skills, delivered by trained educators and counsellors.

Substance abuse prevention is addressed through initiatives such as Vimukthi Mission and Unarvu, which combine counselling with creative and sports-based activities for students. LSGs monitor school attendance, establish drug-free zones around schools, and support community vigilance groups and anti-drug campaigns. Digital safety and screen addiction are tackled through the Kerala Police's Digital De-Addiction (D-DAD) initiative, which integrates awareness, counselling, and therapy.

Institutionalised psychological support is provided through school-based therapy, District-level psychosocial clinics, and specialised programmes. The Department of Women and Child Development, in collaboration with the Department of Education, has deployed expert counsellors in 1,012 Government schools, with plans to extend services to all Government and aided schools. Qualified women counsellors under the Psychosocial Service Programme help prevent adolescent dropout and abuse. Awareness initiatives such as Thalir under the District Mental Health Programme engage teachers, parents, and students from diverse backgrounds.

Adolescent mental health is specifically supported through Unarv and Maanasa. Unarv addresses emotional and behavioural concerns via school counselling, peer support groups, and awareness programmes with strict confidentiality. Maanasa complements this by offering counselling, therapy, and training for parents and educators, focusing on suicide prevention, stress management, and substance abuse, while linking families to local mental health professionals.

Technology-enabled support systems further expand access. Tele-Manas provides 24/7 free tele-counselling, crisis intervention, and referral services through helplines and online platforms, with coordinated follow-up by schools, Childline, and District Child Protection Units. The Gurukulam Project uses digital tools such as attendance tracking, automated SMS alerts to parents, and online counselling via police websites, reducing stigma by enabling discreet access to support.

Community participation remains central to Kerala's approach. Workshops, seminars, and Information, Education, and Communication (IEC) activities build parental capacity in child psychology, mental health awareness, and effective parenting. Peer-support

networks through youth organisations and Balasabhas, alongside coordinated efforts by LSGs, schools, health agencies, and digital outreach campaigns, work collectively to reduce stigma and promote timely help-seeking, ensuring children and adolescents thrive in a supportive environment.

Addressing special needs and vulnerabilities

Kerala recognises children's diverse needs and intersecting vulnerabilities from various social locations. The State ensures inclusion, equity and comprehensive support through targeted and integrated efforts. Various programmes have been initiated to address the needs of children with disabilities, girls, tribal children, urban poor, migrant children, children from coastal regions and those in institutions.

Children with disabilities. Kerala employs a rights-based, life cycle approach to support children with disabilities. It focuses on early detection, intervention, rehabilitation and social integration. State Initiative in the Area of Disability (SID)'s initiative of Anuyatra is formulated as per the Rights of Persons with Disabilities (RPWD) Act of 2016. Anuyatra is a rights-based, campaign-mode, lifecycle approach to disability management. The programme includes District Early Intervention Centres (DEICs) in 14 Districts, Networked Early Intervention, Universal Hearing/ Congenital Anomaly Screening, Autism Spectrum Disorder Programme (SPECTRUM) for early identification, therapy, parental training, and rehabilitation. The initiatives also have components of parental empowerment, inclusive education and community-based rehabilitation. The programme incorporates Anuyatra Digital Tools, like smartphone apps for developmental tests, tracking progress in therapy, and online parental empowerment modules for early screening, intervention, and rehabilitation of children with disabilities.

C.H. Mohammed Koya Memorial State Institute for the Mentally Challenged (SIMC) is a charitable organisation, affiliated with the General Education Department located in Pangappara, Thiruvananthapuram. The institution offers specialised education, training, and rehabilitation for children with intellectual disabilities. Principal operations and facilities include special schools and hostels, diploma programmes in special education and operate vocational training centres, community-oriented parental training, sensory park and accessible. The Autism Parks established by the General Education Department aim to bring children on the autistic spectrum into the mainstream by addressing behavioural issues, encouraging social participation, and enhancing communication skills. Special education, speech therapy, occupational therapy, sensory integration, and behaviour modification programmes are offered. The project provides support services to parents and training for instructors. The General Education Department's scheme for Financial Assistance to Institutions for Intellectually Disabled Children supports 330 special schools operated by NGOs and LSGs. The scheme provides financial assistance for staff honorariums, vocational equipment, uniforms, medical care, study materials, and training programmes.

Healthcare and rehabilitation services. The Child Development Centre (CDC) functions as a central referral, research, and training facility that provides clinical and community services. Its comprehensive mandate encompasses developmental disabilities, early childhood and adolescent care, and support for women's health.

Gender-responsive interventions for children in Kerala

Comprehensive sexuality and gender education. Kerala implements Comprehensive Sexuality Education (CSE) modules in compliance with UNESCO guidelines. These modules cover human growth, puberty, and reproduction; gender roles, stereotypes, and equality; consent, limitations, and respect; STI, HIV/AIDS, and sexual abuse prevention; and cybersecurity and online safety. Scientific, culturally relevant, and age-appropriate knowledge is delivered through life skill education in the School Health and Wellness Programme (UNICEF India, 2022). Through SCERT and other curriculum development bodies, Kerala develops age-appropriate sexuality and gender education materials featuring gradual concept introduction from physical autonomy and safety in primary school to complex concerns in higher grades. The curriculum employs interactive storytelling tools, role plays, and group discussions while maintaining cultural acceptability and relevance.

Through Teacher Training and Capacity Building, Kerala invests significantly in teacher training for gender-sensitive education. The State runs comprehensive gender sensitisation programmes across schools and communities through workshops and campaigns that challenge stereotypes and promote respect for all genders. Gender equity is integrated into school curricula, activities, sports, and leadership opportunities. Kerala's pioneering transgender policy and inclusive education

guidelines emphasise supporting transgender and gender non-conforming children.

Nirbhaya Policy. The State's policy stands out as a pioneering multi-stakeholder convergence model with a dedicated Nirbhaya Cell, being among the first comprehensive State policies in India to integrate prevention, protection, prosecution, and rehabilitation specifically targeting both sexual violence and sex trafficking against women and children within a single framework. It is formulated in compliance with the Juvenile Justice Act 2015. The policy aims to address the concern of sexual violence. Initiatives include specialised Emergency Response Teams that deliver prompt psychological and medical assistance to survivors, implementation of cyber threat programmes, the enhancement of ward-level Child Protection Committees for risk assessment, and responsible parenting initiatives at the block level, including Parenting Clinics and educational partnerships that involve families and communities. The policy also supports gender non-conforming children and children with disabilities, ensuring that protection services are tailored to meet their specific needs.

Health and Nutrition Services. ICDS and POSHAN Abhiyaan prioritise girls (especially adolescent girls), and pregnant adolescents for supplementary nutrition, anaemia prevention, and health check-ups.

Kerala leads nationally in menstrual hygiene management by distributing free sanitary napkins in Government and aided schools, particularly for adolescent girls from marginalised communities. LSGs and School Management Committees monitor provisions of school bathrooms, waste disposal, and primary maintenance. Awareness campaigns and product distribution are carried out by partnering with NGOs and the private sector.

The State implements effective gender-based violence prevention measures through school-based awareness programmes on safe touch, reporting abuse, and seeking help. Survivors receive confidential help from Childline 1098 and school counselors. DCPUs, NGOs, and Women and Child Development Department provide legal, psychosocial, and rehabilitation services. Police, schools, and health staff undertake extensive Gender-based violence sensitivity training.

Kerala's comprehensive, rights-based and participatory approach helps children and adolescents to make informed choices, fight prejudice, and defend themselves while addressing their gendered needs and vulnerabilities.

Interventions for children belonging to vulnerable communities

Children belonging to tribal communities often experience socioeconomic marginalisation and geographic isolation, necessitating targeted interventions. Kerala tackles these challenges through focused nutrition initiatives implemented by the Integrated Child Development Services (ICDS) and outreach efforts from the Health and Women and Child Development Departments. The State facilitates educational access via residential schools and hostels, offering bridge courses and retention support. Community health initiatives utilise mobile health units and tribal health volunteers to conduct regular check-ups and immunisations, emphasising cultural inclusion by adapting curricula to tribal languages and contexts.

Kerala integrates children from the coastal regions as a priority vulnerable group across all major child development schemes. The Theerashree Programme by Kudumbashree operates in 82 coastal Panchayats, forming neighbourhood groups, providing youth skill training and job assurance, educational support, and livelihood enhancement with special volunteer monitoring. Prathibhatheeram conducts daily classes for students in grades from five to ten, whereas Kayikatheeram implements sports programs with the support of the Sports Council.

For addressing the children from urban poor communities and children in street situations, Urban Integrated Child Development Services and anganwadis provide nutrition, early childhood education, and healthcare, collaborating with local entities to ensure basic amenities. The Integrated Scheme for Children in Street Situations intends to tackle destitution and enable the transition from life in the streets situations through the provision of shelter, nutrition, healthcare, education, and recreational activities, while also safeguarding children against abuse and exploitation. The Jyothi Campaign facilitates the enrolment of migrant children in schools and anganwadis through health assessments, welfare support and Aadhaar-linked registration. Community volunteers fluent in children's original languages provide orientation and counseling and Migrant-Friendly Schools have flexible admission policies.

Institutionalised children. Ammathottil (Cradle) cares for abandoned children. The Integrated Child Protection Scheme (ICPS) monitors Child Care Institutions focusing on deinstitutionalisation and family-based alternatives, including foster care and adoption. The Our Responsibility to Children (ORC)

programme improves life skills and behaviour in 380 schools. Kaval offers counselling and reintegration plans for children in conflict with law, with NIMHANS technical support, while Margajyothi helps children from CCIs get further education and scholarships.

Special support programmes

Covid-19 orphaned children. The package provides financial assistance for children who lost both parents to Covid-19, including Rs 3 lakh deposited for the child, Rs 2,000 monthly allowance until age 18, and emergency aid for financial security and continuous support.

Snehapoorvam programme. Provides financial aid to orphaned, single-parent and HIV/AIDS-affected children living with relatives or community members. In order to facilitate convergence and targeted outreach for vulnerable children, the State has implemented the digital mapping of at-risk children in specific districts, integrating data from the health, education and Women and Child Development Departments.

Substance abuse prevention and rehabilitation

To address substance abuse among children in the State, the Anti-Drug Campaign conducts District and school-level activities through strengthened Janajagratha Samithies, co-curricular activities, and parent empowerment programmes. The Clean Campus Safe Campus campaign is conducted with law enforcement to reduce drug access in schools. Community-based strategies encompassing Balasabhas and Kudumbashree execute awareness initiatives and dialogues, while LSGs incorporate preventive measures into child protection frameworks. Kerala offers medical detoxification and counseling and family therapy through the Social Security Mission's adolescent-friendly de-addiction centres. District Child Protection Units and Childline 1098 evaluate and strategise care for impacted children, while specialised residential facilities function through TTK Hospital, NIMHANS, and local NGOs.

Way Forward

Government policy recognises children as holders of civil, social, economic, and other rights. Children will have free and universal access to the best possible means of early childhood and school education, with special support to children from social groups that have suffered social and economic exclusion. A comprehensive policy for children includes universal access to the highest available standards of maternal and child healthcare, and to nutrition in general, and early childhood nutrition in particular. High quality education and health care also include counseling services and psychological support in schools. Kerala's school education policy is committed to bringing up children in a secular, democratic, and socially inclusive environment.

Government policy pays particular attention to protection from abuse and exploitation, and seeks to ensure equity and non-discrimination to all children-regardless of gender, caste, or economic status. Child policy is also inclusive with respect to children with disabilities.

In general, the Government of Kerala is committed to mainstreaming children's interests across sectors through the instrument of the gender budget, and to protect and promote the well-being and agency of every child. The State's future strategies emphasise:

Enhancing psychosocial support. Strengthening school- and community-based mental health initiatives, integrating life skills education, and training educators are essential to promote early intervention, resilience, and overall psychological well-being among children.

Addressing substance abuse and screen addiction. Comprehensive strategies involving awareness campaigns, peer-led interventions, expanded rehabilitation services, and active engagement of families, schools, and communities are needed to prevent and address substance abuse and screen addiction among adolescents.

Creating inclusive public play spaces. Establishing at least one accessible, inclusive, child-friendly playground in each Panchayat, and expanding after-school recreational programmes to promote physical and psychological well-being, and social cohesion.

Addressing gaps in service delivery. Through targeted policies, inter-departmental collaboration, and strengthened local governance, the State seeks to ensure equitable access to nutrition, education, and healthcare for children from all social groups, particularly tribal and coastal communities.

Collaboration among Government agencies, non-governmental organisations, and citizens will convert these strategies into measurable results. Let us build a future where no child is left behind.

Chapter 8
Empowering Persons with Disabilities

From 2016 to 2026, Kerala's sustained commitment to the rights of persons with disabilities has earned national recognition. In 2019, the State was awarded as the Best State in Promoting Empowerment of Persons with Disabilities by the Ministry of Social Justice and Empowerment. Plan allocations to schemes for persons with disabilities have more than doubled between 2016 and 2026. The Governments of Kerala adheres to the principles stated in the United Nations Convention on the Rights of Persons with Disabilities UNCRPD (2013).

The 2011 Census reported 2.7 crore persons with disabilities, constituting 2.2 per cent of India's population. Movement-related disabilities are the most common (20 per cent), followed by visual (18.8 per cent), and hearing impairments (18.9 per cent). Disability intersects with caste, gender, and rural-urban divides, and women and rural persons with disabilities face compounded exclusion. The India Ageing Report 2023 reported that India had an elderly population share of 10.1 per cent in 2021, which is projected to rise to 13.1 per cent by 2031. The country will face unprecedented structural and fiscal demands for geriatric and disability services because of the strong correlation between ageing and disability prevalence.

Status of Disability in Kerala

Kerala's comprehensive survey done by the Kerala Social Security Mission (KSSM) in 2015 identified key demographic characteristics and types of disabilities. Approximately 7.9 lakh persons with disabilities were identified, accounting for 2.3 per cent of the State's population. The majority of were male (55.3 per cent).

Age-wise, 40.6 per cent fell within the 35–59 age-group, while children constituted 16.5 per cent. The prevalence rate across age groups was 232 per 10,000 persons, increasing to 488 per 10,000 among the elderly (aged 60 and above). A significant proportion (52 per cent) did not possess a disability certificate. Among those with certification, 2.8 per cent (had 1 to 40 per cent disability, 36.7 per cent had 40–79 per cent disability, and 8.6 per cent had 80–100 per cent disability. In terms of marital status, 51.5 per cent were married, while 2.5 per cent were separated or divorced. The number of bed-ridden persons with disability was 63,229.

The most prevalent type of disability across all gender groups was locomotor disability (32.9 per cent). The least reported conditions were multiple sclerosis (0.06 per cent) and thalassemia (0.07 per cent). Multiple disabilities excluding deaf-blindness constituted 17.3 per cent, while deaf-blindness was reported in 0.1 per cent. Mental illness and intellectual disability accounted for 12.7 per cent and 8.7 per cent, respectively. Regarding economic status, 30.6 per cent of persons with disability had a Monthly Per Capita Expenditure (MPCE) below Rs 500, indicating a significant level of economic vulnerability. A significant educational gap exists, with 50.5 per cent of never having attended school or dropping out at the primary level. Only 32,090 persons with disability pursued higher education, with a small number achieving postgraduate or technical qualifications.

According to the survey, 57.1 per cent had acquired disabilities, while 42.9 per cent were born with disabilities such as cerebral palsy, intellectual disability, autism spectrum disorder, and hearing impairment. Acquired disabilities were primarily attributed to childhood illness (about 12 per cent), accidents (10.7 per cent), burns (0.6 per cent), and head injuries (2 per cent). Most accidents occurred on roads, in homes, or on agricultural land.

Employment opportunities and social welfare support for persons with disability in Kerala are evolving. Among working-age PwDs, 1,68,837 were employed, with most in temporary or daily wage jobs. Various forms of social assistance, including disability pensions and educational support, are disbursed to 3,80,623 PwDs. The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) enrolled 68,590 PwDs, providing some economic support. In terms of living arrangements, 23,190 PwDs were living alone, 3,417 resided with relatives, and 18,114 lived in institutional settings. Under the provisions of the National Trust Act, 7,900 PwDs had legally appointed guardians. (Kerala Social Security Mission survey report 2015).

Initiatives for Persons with Disability

The Government of Kerala has implemented various initiatives to support persons with disability through its Five-Year Plans. Key initiatives include the Anuyatra campaign for early intervention and rehabilitation, expansion of BUDS Schools and Rehabilitation Centres for children with intellectual disabilities, and increased access to disability certification and pensions.

The Kaivalya scheme supports self-employment and livelihood generation, while the Sahachari scheme promotes inclusive education and peer support. Social protection was strengthened through disability pensions, medical aid, and targeted financial assistance under schemes like Sevana and Snehapoorvam. Infrastructure improvements under the Barrier-Free Kerala initiative sought to enhance physical accessibility, and services were increasingly decentralised to Local Self Governments (LSGs) and community-based models such as Vayomitram for elderly PwDs. The 14th Five-Year Plan emphasises digital inclusion, participatory governance, and community-based care. It also proposes innovations include universal design, accessibility audits, and real-time monitoring of services.

The Social Justice Department has led various initiatives to support people with disabilities in Kerala.

Awareness programmes. During the 13th Five-Year Plan, Kerala undertook multiple awareness initiatives to combat stigma and prejudice surrounding disability, including programmes such as Amma Care, Amma Teacher, and the National Institute of Speech and Hearing (NISH) Interactive Disability Awareness Seminars (NIDAS). The Subhayathra scheme and World Disability Day celebrations further promoted dignity and inclusion. Under the 14th Five-Year Plan (2022–27), initiatives expanded to include structured innovation campaigns by Kerala Development and Innovation Strategic Council (K-DISC), strengthened partnerships through NISH and KSSM, and the formal inclusion of arts-based empowerment programmes such as the magic training and Different Arts Centre for children with intellectual disabilities.

Programmes with a life-cycle approach. Kerala's rights-based disability management was institutionalised under Anuyatra, launched during the 13th Five-Year Plan, following the Rights of Person with Disabilities (RPwD) Act 2016. This umbrella programme adopted a life-cycle approach covering prevention, early intervention, rehabilitation, and assisted living, in convergence with multiple departments. Annually, 5 to 6 lakh children benefit. Kathoram, a component of Anuyatra, focuses on hearing disability management through universal newborn screening, early diagnosis using BERA (Brainstem Evoked Response Audiometry), and interventions like Sruthitharangam (cochlear implantation and auditory-verbal therapy for children under five). Anuyatra also includes Spectrum, a project for early autism detection and support, establishing Autism Centres in six medical colleges and a Regional Autism Rehabilitation and Research Centre at National Institute of Physical Medicine and Rehabilitation (NIPMR). By 2023, 109 cochlear implant surgeries were completed, 1,34,151 children received care through Mobile Intervention Units, 1,343 attended Special Anganwadis (338 mainstreamed), and 33,260 children received autism-specific care with 2,102 accessing NIPMR's Regional Autism Centre.

Rehabilitation schemes. Athijeevanam, implemented in the 13th Plan, continued to support NGO-led rehabilitation through a Rs 1.4 crore grant disbursed to 13 NGOs in 2023. Since 2019, the State Initiative of Dementia has supported patients annually, later establishing a daycare centre in Thrissur and a full-time residential facility in Edavanakkad. Pratheeksha targets individuals with intellectual challenges, while the centrally sponsored Deendayal Disabled Rehabitation Scheme (DDRS) enables early intervention and skill training through support to voluntary organisations. By 2020, the Social Justice Department (SJD) operated 29 welfare institutions and 2 vocational centres- 15 exclusively for PwDs, and the Women and Child Development (WCD) Department managed 44 similar facilities, aiding 2,000 institutional and 55,000 outreach beneficiaries annually, though occupancy stood at only 58 per cent. During the Covid-19 pandemic (2020-21), 73 welfare homes and two training centres coordinated online therapy and counselling through NISH, State Nodal Agency Centre (SNAC), and Local Level Committees (LLC). By 2023–24, SJD operated 5 homes for PwDs and 8 for persons with intellectual disabilities, with 61,785 individuals residing in SJD and WCD-registered institutions — including 14,131 PwDs and 2,779 persons with intellectual disabilities — exceeding the sanctioned capacity of 2,597. Kerala maintains one State-run institutional care centre for children with intellectual disabilities, located in Kozhikode.

Disability certificate. A disability certificate is essential to avail benefits under the RPwD Act in India. As part of the Anuyatra programme, Disability ID cards were issued through dedicated Disability Certification Camps; as of December 31, 2025, a total of 4,19,554 ID cards have been issued in Kerala.

Scholarships/educational support. Kerala implem ented major schemes under the 13th Five-Year Plan to support students with disabilities. First, the scholarship for students with disabilities pursuing Degree and PG courses through Distance Education disbursed Rs 80,095in 2024-25. Second, financial assistance is provided to 1,000–1,500 students with disabilities

pursuing Classes 10, 11, 12, or equivalent examinations, annually. Third, Vidyakiranam, which offers educational support to children of parents with disabilities, recorded a significant increase in beneficiaries from 2,013 in 2017–18 to 6,079 in 2023. Fourth, Vidyajyothi provided uniforms and learning material to students with physical disabilities; in 2024-25 Rs 10,61,104 was spent for 372 students. Fifth, another general scholarship for students with disabilities attending school, college, professional, PG, or technical courses consistently benefits 250–400 students with disabilities each year. Sixth, Vijayamrutham, a cash award scheme for meritorious students with disabilities in graduate, postgraduate, or professional courses, supported 47 beneficiaries with Rs 4,30,339 in 2024-25. Additional initiatives include Sahachari, which incentivised NSS, NCC, and SPC units assisting students with disabilities, and Sreshtam, which recognised excellence in sports and arts.

Employment and skill training and technological support. Launched under the 13th Plan, the M Power Incubator annually trains 5–20 children with intellectual disabilities in magic. Innovation by Youth with Disability (I-YwD) programme, supported by NISH and now in its third cohort, offers structured innovation training to promote entrepreneurship and digital inclusion among youth with disabilities. The Insight programme was started in 2007 to explore ways in which Information and Communication Technology (ICT) can be leveraged to address challenges faced by people with disabilities. The initial phase of the programme focused on visual impairment. In 2009, it was extended to include an experimental programme for children with cognitive challenges.

Distress relief. Kerala's financial aid programmes for persons with disabilities include multiple targeted schemes. The Pariraksha scheme supports around 1,000 PwDs annually during emergencies. Parinayam, launched during the 13th Plan, provides marriage assistance to girls with physical disabilities and daughters of parents with disabilities, benefitting 500–800 persons each year. Under the Imprest Money Scheme, the rehabilitation of destitute persons abandoned in public places is supported with food, clothing, medical aid and other emergency services The Snehaswanthwanam scheme grants Rs 2,200 per month to bedridden victims and Rs 1,700 to those receiving disability pensions- supporting 5,304 in 2023–24. The Special Aswasakiranam scheme provides Rs 700 monthly to caregivers of endosulfan victims who are fully bedridden or persons with intellectual disabilities, benefitting 776 individuals in 2023–24. Educational aid between Rs 2,000–Rs 4,000 was extended to 804 children from such families in 2022–23, and 440 children in 2023–24. Additionally, under Snehapoorvam, Rs 1,700 lakh was granted in 2024 to 57,187 orphans, including children with disabilities.

Accessibility/assistive devices. The Scheme for Implementation of the Rights of Persons with Disabilities Act (SIPDA) is a centrally funded initiative aimed at enhancing barrier-free access and rehabilitation infrastructure. In 2021-22, Rs 1.5 crore was spent under this scheme, which increased to Rs 4.5 crore in 2023. The centrally sponsored Assistance to Disabled Persons for Purchase/Fitting of Aids/Appliances (ADIP) Scheme benefits over 1,500 PwDs annually by distributing modern and scientifically designed aids and appliances to promote rehabilitation and economic empowerment. Matru Jyothi, a scheme offering Rs 2,000 per month to visually impaired mothers, also provides assistive devices to 50–100 PwDs each year. Swasraya supports the self-employment of single mothers of children with disabilities, with 101 beneficiaries in 2020–21 and 80 in 2022–23, incurring an expenditure of Rs 21,85,031. Barrier Free Kerala, initiated during the 13th Plan, aims to make public infrastructure accessible across the State. Subhayathra and Thanal, schemes of the Kerala State Physically Handicapped Persons Welfare Corporation, offer assistive devices such as electric wheelchairs, powered beds, high-tech limbs, and laptops with voice software. These were also distributed to flood-affected persons with disabilities during the 13th and 14th Plan. The Rashtriya Vayoshri Yojana (RVY) provides assistive devices to elderly persons below the poverty line with age-related disabilities. Also, the Welfare Corporation subsidises lottery agents with disabilities and provides financial assistance to blind and orthopedically handicapped advocates annually. A previous report indicates that Swasraya assisted 100–300 single mothers of children with disabilities each year to pursue self-employment).

Aswasakiranam scheme provides Rs 600 monthly assistance to full-time caregivers of persons with severe disabilities, or are elderly, supporting 1,13,717 caregivers in 2019–20, 1,14,188 in 2020–21. Following the mustering process, an amount of Rs 37.3 crore was disbursed to 28,385 beneficiaries in 2024–25. The monthly assistance has been increased to Rs 1000 in the 2026-27 Budget.

Other financial assistance. Samaswasam provides financial aid to individuals with Haemophilia and Sickle

Cell Anaemia, while Thalolam offers free treatment for children under 18 with conditions like Cerebral Palsy, Brittle Bone Disease, Hemophilia, Thalassemia, Sickle Cell Anaemia, orthopedic deformities, neurodevelopmental disabilities, congenital anomalies (including Endosulfan victims), and accident-related surgical needs- benefiting 13,000–20,000 children annually. The Niramaya Scheme under the National Trust Act (1999) offers insurance coverage up to Rs 1 lakh for individuals with autism, cerebral palsy, intellectual and multiple disabilities.

Schemes by other departments. The Department of Health and Family Welfare has been at the forefront of health interventions, early detection, and rehabilitation programmes for persons with disabilities in Kerala. The National Programme for Control of Blindness promotes community-based eye care, while the Salabham Comprehensive Newborn Screening Programme ensures the early detection of various conditions among newborns. As of 2022–23, the State operates 11 Physical Medicine and Rehabilitation Units and three Mental Health Centres. Through the Arogyakiranam scheme, free healthcare services are provided to individuals from birth to 18 years, with 13,051 claims settled during 2022–23. The scheme is being implemented by the State Health Agency since 2022-23, and the total amount claimed as of October 2025 is Rs 60.3 crore.

Several institutions in Kerala also provide specialised medical and educational support for persons with disabilities. Medical colleges offer treatment for leprosy and neurological disorders, while the Child Development Centre (CDC) treateds outpatients and provides training. The Sree Chitra Tirunal Institute further enhances rehabilitation services by providing neurological treatment and has established a sensory park for therapeutic use.

The Department of General Education promotes inclusive education through programmes such as the Samagra Shiksha Abhiyan, which integrates multiple initiatives to ensure equitable learning opportunities. Students with disabilities are enrolled in inclusive education programmes and there are Government-run special schools and various resource centers catering to children with disabilities.

In the field of higher education, the Department of Higher Education focuses on inclusivity through scholarships and barrier-free campus infrastructure. In 2024, 1,418 students with disabilities benefited from post-matric scholarships, and Mahatma Gandhi University implemented a barrier-free campus under the Community Disabled Management and Rehabilitation Programme.

The Local Self-Government Department plays a significant role in supporting persons with disabilities through various welfare schemes. Scholarships are provided to children with disabilities under the Integrated Child Development Services (ICDS), while the Mahatma Gandhi National Rural Employment Guarantee Scheme makes wage employment opportunities available to persons with disabilities.

The Department of Women and Child Development emphasises early intervention and educational support through special anganwadis in Kozhikode District, which provide remedial therapy to improve the daily living activities of children with disabilities.

The Department of Labour and Skills complements these efforts through financial assistance and skill development programmes. The Unemployment Assistance Scheme grants Rs 120 per month to unemployed youth with disabilities, and the Kaivalya scheme promotes vocational training and self-employment.

The Department of Sports encourages athletic participation among persons with disabilities through scholarships and development initiatives, such as the Dr. APJ Abdul Kalam Scholarship, which supports five to fifteen sportspersons with disabilities annually.

The Department of Home has also introduced psychosocial support and conflict resolution mechanisms through the Chiri Project and Domestic Conflict Resolution Centres, aimed at safeguarding persons with disabilities from domestic violence.

Financial assistance is further provided by the Department of Revenue through the Social Security Pension Scheme, which benefits approximately 3.7 lakh persons with disabilities. The pension amount has been progressively increased from Rs 600 in 2016 to Rs 1,600 in 2021, and further to Rs 2,000 in 2025.

In addition to these departmental efforts, Kerala has introduced several cross-sectoral initiatives to promote disability inclusion. Digital accessibility has been enhanced through localised educational apps and accessible Government service portals, and the Kerala State Disaster Management Authority (KSDMA) integrates disability inclusion into disaster preparedness and response strategies.

Institutions. The following institutions in Kerala provide comprehensive services for the rehabilitation and support of PwDs include:

National Institute of Speech and Hearing (NISH). NISH is a premier institution for disability studies and

rehabilitation sciences, offering integrated academic and therapeutic services. Services expanded significantly in 2022–23, with 3,107 children receiving early intervention, 14,649 audiology sessions, 4,792 speech-language therapy cases, and 7,404 allied consultations, while 507 students pursued academic programmes. In 2023–24, NISH scaled further, delivering early intervention to 10,656 children, 17,011 audiology sessions, 5,378 speech-language cases, 7,732 medical and psychological consultations, and academic support to 847 students. In 2024–25, NISH delivered early intervention to 10,768 children, 16,975 audiology sessions, 1,285 speech-language cases, 4,944 medical and psychological consultations, and academic support to 786 students.

National Institute of Physical Medicine and Rehabilitation (NIPMR). NIPMR is a centre of excellence under the Social Justice Department, and delivers comprehensive services in early identification, intervention, therapy, and rehabilitation for persons with multiple disabilities, cerebral palsy, and stroke. NIPMR provided 86,457 and 98,007 consultations respectively in 2023–24 and 2024-25. It also implements Special Training and Empowerment Programme for Parents (STEPS), the mobile medical unit Rehab on Wheels, and the Wheel Trans transport service. Its Centre for Mobility and Assistive Technology (C-MAT) manufactures and distributes mobility aids in collaboration with Government agencies.

Community Disability Management and Rehabilitation Programme (CDMRP). CDMRP, an extension centre of the Department of Psychology at the University of Calicut supported by the Social Justice Department, provides comprehensive, evidence-based community services for the prevention, early intervention, and rehabilitation of children with developmental disabilities.

Institute of Mental Health and Neurosciences (IMHANS). The Institute of Mental Health and Neurosciences (IMHANS), established in 1982 in Kozhikode, provides multidisciplinary mental health care through four adult psychiatry units, a Child Development Centre, an Autism Centre, and the Recovery Facilitation Project for persons with chronic psychiatric illness, while also offering psychosocial support to tribal populations in Wayanad. IMHANS provided extensive outpatient services, handling over 24,617 cases in 2023–24.

Kerala State Handicapped Persons Welfare Corporation (KSHPWC). The KSHPWC has made significant strides in empowering persons with disabilities (PwDs) through various support services and financial assistance programs. In 2019-20, 1,213 PwDs received assistive devices, 141 secured self-employment loans, and 1,000 blind individuals were provided smartphones. In 2020-21, 4,408 received assistive devices, 606 children benefited from fixed deposits, and 165 received side-wheel scooters. In 2022-23, 1,124 beneficiaries received assistive devices, and 373 individuals received self-employment aid. In 2023-24, 733 received assistive devices, 132 PwDs received Rs 25,000 aid without collateral, and 731 students were awarded Rs 5,000 each. In 2024-25, 893 received assistive devices, 140 PwDs received Rs 25,000 aid without collateral, self-employment loanswere distributed to 269 persons with disabilities. and 664 students were awarded Rs 5,000 each. The Corporation has started recently a State-wide programme named Susakthi for organising Self-Help Groups for peoples with disabilities.

State Commissionerate for Persons with Disabilities. The Commissionerate oversees disability schemes, fund utilisation, grievance redressal, and awareness activities to support PwDs. It was established under the Persons with Disabilities Act (1995). The Commissionerate conducts seminars for stakeholders.

Way Forward

Certain gaps remain in service delivery to persons with disabilities in Kerala. Fragmented coordination among departments has led to inefficiencies, and access to early intervention and inclusive education, particularly in rural areas, needs strengthening. Particular focus on employment and livelihood opportunities for persons with disabilities, and workplace accessibility, is necessary.

Looking ahead, Kerala's Vision 2055 for Disability Inclusion envisions the State as a global model of inclusivity. The approach is grounded in universal accessibility, community-based care, and data-driven governance. Strategic milestones include universal screening, inclusive education, and comprehensive economic empowerment for all persons with disabilities.

Chapter 9
Empowering the Elderly

The Government of Kerala has made significant advances in serving the elderly through a comprehensive, rights-based approach backed by substantial public investment. The State Assembly passed an Elderly Budget of Rs 36,812.1 crore in 2025-26, representing 18.74 per cent of the total State Budget. The Elderly Budget is multi-departmental and includes investments in pensions, health care, and local government. Over 75 per cent of the elderly in Kerala are covered by pension schemes, whose objective is to contribute to income security and personal dignity. Kerala has strengthened geriatric healthcare through dedicated clinics, preventive vaccination programmes, elderly-friendly hospitals, telemedicine, and community initiatives such as Vayomithram and Sayamprabha. It has expanded institutional and home-based care, regulated old-age homes, and promoted active ageing through education, livelihoods, and Kudumbashree networks. The Elderly Commission that has newly been appointed by the GoK works on issues of legal protection, social inclusion, and capability expansion among the elderly.

Demographic trends indicate that Kerala is currently passing through a critical stage of demographic transition. Kerala remains India's most rapidly ageing society, exhibiting a demographic profile closer to East Asian and European patterns than the national average. Three critical factors — low fertility rates sustained over decades, shaped by women's education and employment; increased life expectancy, especially among women; and large-scale outmigration of the working-age population, leading to a higher proportion of senior-only households — underpin this accelerated ageing.

The Old Age Dependency Ratio (OADR), which measures the number of individuals aged 60 and above per 100 working-age adults (15–59 years), has been rising steadily in Kerala from 19.6 per cent in 2011 to 26.1 per cent in 2021, and is projected to reach 34.3 per cent by 2031- more than double the national average. Equally noteworthy is the Very-old Dependency Ratio, capturing those aged 80 and above relative to the working-age population; this sub-group is expanding at an even faster pace than the general elderly cohort and is expected to reach 8.5 per cent of Kerala's population by 2031. The growing ratio of very-old individuals increases demands for health care, and long-term institutional care, and has profound implications for care provision, health infrastructure, and fiscal policy.

Kerala's draft State Policy on Ageing (2024) calls for a rights-based, life-course approaches that recognise older people, with their skills and experience, as important contributors to society and social development. Current Government policy seeks to foster their economic independence, ensure their social inclusion, protecting them from abuse and hardship, and to create age-friendly environments that support active and productive engagement across all spheres of life.

Factors Influencing the Quality of Ageing

Gender

Kerala's elderly population is marked by significant gender asymmetry. Based on the Census 2011, the sex ratio among older persons (age 60-64) stood at approximately 1064 women per 1000 men, reflecting a clear predominance of women in later life. This imbalance becomes even more pronounced in advanced ages: among those over 80 years, the ratio exceeds 1651 women per 1,000 men. The difference in longevity is a major driver of this trend, with female life expectancy at birth estimated at around 78.4 years, compared to 71.9 years for men. Over the decades, improvements in healthcare and reductions in maternal mortality have further extended the lifespan of women, contributing to what demographers term the "feminisation of ageing". This demographic pattern has important social and economic implications. The higher survival rates of women mean that a large proportion of elderly women live alone, single or as widows, often without adequate family support. Consequently, older women are at greater risk of poverty, dependency, and social isolation, especially where property ownership and savings among women are limited. Addressing these challenges requires gender-responsive policies that provide economic security, accessible healthcare, and community support systems tailored to the needs of elderly women.

Rural–urban patterns. Kerala's demographic profile is characterised by widespread ageing across both rural and urban regions, though the magnitude and implications differ in important ways. Despite being one of India's most urbanised States, with nearly half of its population residing in urban areas, rural areas continue to exhibit a proportionally larger elderly share. Based on the India Ageing Report 2023- in 2021, approximately 17.5 per

cent of Kerala's rural population comprised individuals aged 60 and above, compared to 15.4 per cent in urban areas. The India Migration Report 2017 mentions the rural concentration of older persons is partly attributable to sustained outmigration of working-age adults, leaving behind elderly parents and relatives in villages. The phenomenon of "left-behind" elders is further compounded by declining fertility rates and the erosion of traditional extended family support structures, resulting in an ageing rural demography with vulnerabilities.

Return migrants. Kerala today is also witnessing a steady return of ageing migrants, many of whom are now in their late fifties to seventies. Chronic health problems such as diabetes, cardiovascular disease, and musculoskeletal disorders are widespread among this group, exacerbated by occupational hazards and the lack of preventive care during their migration years[1]. Reintegration into local communities is often fraught with difficulty, as returnees may encounter housing insecurity, loss of social status, and stigma if they return without adequate savings or with unanticipated health burdens. One of the schemes that address this is the Pravasi pension provided by the Kerala Pravasi Welfare Board after the age of 60 years, at Rs 2000 per month. The minimum monthly contribution for the pension is Rs 300 for non-resident Keralites abroad, and Rs 100 for non-resident Keralites in India.

Economic status. As per the Elderly in India Report 2021, 72 per cent of elderly women and 31 per cent of elderly men in Kerala were economically dependent, reflecting broader national patterns of declining work participation and inadequate formal income support in old age. While Kerala's total workforce is gradually shrinking due to demographic transition, a substantial number of older persons remain engaged in informal or subsistence employment, especially in rural areas. Income sources among Kerala's elderly include State-sponsored social security pensions, remittances from migrant children, agricultural wages, and limited earnings from informal sector work. However, the proportion of elderly reliant solely on familial support or pensions has increased. Schemes like Navajeevan, which provide self-employment support for those aged 50–65, aim to counteract this vulnerability. There is a need to institutionalise second-career opportunities, create flexible workspaces for older persons, and provide financial incentives for community-based micro-enterprise participation among the elderly. Kerala operates one of the most extensive social security pension systems in India, blending centrally sponsored schemes like the Indira Gandhi National Old Age Pension Scheme (IGNOAPS) with generous State top-ups.

Kerala's elderly population faces substantial out-of-pocket (OOP) health expenditures, driven by the prevalence of non-communicable disease (NCD), multi-morbidity, and gradually expanding insurance coverage. According to the 75th Round of the National Sample Survey (2017–18), approximately 27 per cent of elderly households in Kerala experience catastrophic health spending, defined as health expenses exceeding 10 per cent of total household consumption. The Karunya Arogya Suraksha Padhathi (KASP) supports a large population of the elderly with cashless treatment.

Elderly populations in Kerala, particularly in rural and lower-income groups, face challenges in accessing formal financial systems. Many rely on intermediaries such as relatives or agents for banking transactions, often risking fraud or loss of control over their finances. The draft Kerala State Policy on Ageing (2024) recommends proactive financial literacy drives, improved grievance redressal for pension delays, and promotion of safe, accessible savings and credit products tailored to the needs of older persons.

Economic dependency among Kerala's elderly is strongly gendered and spatially uneven. In rural Kerala, elderly women may face asset-poverty, limited access to digital banking tools, and are more likely to live alone or in skipped-generation households. Urban elderly women fare slightly better in terms of pension coverage but face higher cost of living and lower family support due to changing household structures. Addressing gendered economic dependency requires identifying income streams for elderly women, ensuring property documentation in their names, and increasing representation in community-based elder self-help groups. Additionally, women-specific pension top-ups, widow allowances, and legal support against property dispossession could be instrumental in closing this persistent gender gap. Kerala's State Rural Livelihood Mission (SRLM) under the National Rural Livelihood Mission– Elderly Inclusion program by Kudumbashree is providing social and psychological support for the elderly and creating a system for protecting the rights of elder at the Panchayat-level through neighbourhood networks.

Health and social status. Kerala's elderly population is experiencing a disproportionate burden of morbidity,

[1] Shahul Hameed et al., 2013

especially from non-communicable diseases (NCDs), mental health conditions, and cognitive impairments like dementia. As per the Longitudinal Ageing Study in India (LASI) Wave 1 (2017-18), over 70 per cent of Kerala's elderly report at least one chronic condition, with hypertension, diabetes, arthritis, and cardiovascular diseases among the most prevalent. The India Ageing Report 2023 found that mental health issues, including depression and anxiety, are also significant, with studies estimating that nearly 1 in 4 older adults in Kerala exhibit symptoms of psychological distress. Dementia presents a growing public health challenge. The Kerala State Initiative on Dementia (Smruthipadham) estimates that approximately 4.86 per cent of persons aged 65 and above are affected. The rising prevalence of cognitive decline demands the urgent expansion of dementia care services, caregiver training, and public awareness to counter stigma and ensure early diagnosis.

Functional ability, measured through Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL), is a critical determinant of autonomy and quality of life in older adults. According to LASI, nearly 22 per cent of Kerala's elderly report difficulty with at least one ADL such as bathing, dressing, or using the toilet, and over 35 per cent experience limitations in IADLs such as managing finances, taking medications, or using communication devices. As per the India Ageing Report 2023, these limitations are more pronounced in the 75+ age group and among elderly women. Functional decline often correlates with multi-morbidity, under-nutrition, and poor mental health[2]. The feminisation of ageing in Kerala, with more elderly women than men, particularly in the 80+ cohort suggests a gendered dimension to ADL/IADL losses. Without adequate family or institutional support, these limitations compromise independent living, increase caregiving burden, and heighten vulnerability to neglect or abuse.

There has been a significant increase in health-service utilisation by older persons in Kerala, particularly since the Covid-19 pandemic. This surge reflects both improved accessibility (through schemes like Karunya Arogya Suraksha Padhathi, Vayomithram, and mobile clinics) and the growing prevalence of chronic illnesses. Notably, the integration of e-Health with social welfare databases has enabled better tracking and targeted delivery. e-Health data from the Department of Health shows that outpatient visits among the elderly rose from 7.6 lakh in 2019–20 to 25 lakh in 2023–24, while inpatient admissions increased nearly eightfold in the same period.

Interventions of the Government of Kerala

The Government of Kerala is very particular about the protection of the rights of the elderly and the effective implementation of the Maintenance and Welfare of Parents and Senior Citizens Act, 2007. This includes strengthening Maintenance Tribunals, and improving the quality and reach of community-level services including doorstep delivery of services and daycare facilities in collaboration with LSGs, Kudumbashree, and NGOs. The State Government stands for a change in the outlook, and promotes Active Ageing. This calls for a collaborative effort from the Social Justice Department as the nodal department for the activities for the elders and multiple other departments and agencies actively involved in the care of the elderly, including the LSGs, NGOs, and the local communities.

Agencies and institutions involved in elderly care

Kerala's multi-tiered approach to elderly welfare reflects a strong convergence of policy, implementation, and local governance. The Department of Social Justice is the nodal agency for designing and executing schemes for senior citizens, particularly in the areas of institutional care, destitution relief, and geriatric social protection. The Kerala Social Security Mission (KSSM), coordinates the operational rollout of schemes such as Vayomithram, Ashwasakiranam, and Navajeevan, with a focus on health, caregiver support, and urban outreach. Meanwhile, Local Self-Governments (LSGs) function as critical service delivery units, and are empowered to allocate 5 per cent of their Development Funds to elderly welfare. Kerala's Orphanage Control Board (OCB) regulates and monitors non-governmental old age homes, ensuring standards under institutional care guidelines. The Department of Indian Systems of Medicine (ISM) supports Ayurveda-based interventions like Vayoamrutham, while Kudumbashree, the State's poverty eradication mission, champions social inclusion through Elderly NHGs, Harsham Geriatric Care, and the Snehitha Calling Bell initiative for elders living alone. This diversified network, with overlapping yet complementary mandates, has helped Kerala institutionalise a comprehensive care framework grounded in rights, dignity, and accessibility for older persons.

Elderly policy evolution and legislative framework

Kerala has been a forerunner in formulating elderly care policy in India, with a trajectory shaped by global

[2] Srivastava et al., 2022

Table 9.1 *Evolution of elderly policy in Kerala*

Policy Evolution Timeline	Milestone
2006	Kerala Old Age Policy adopted
2007 to present	MWPSC Act implemented with District Tribunals
2013	State Policy for Senior Citizens (revised)
2024	Draft Kerala Policy on Ageing with life-course approach
25/04/2025	Kerala State Elderly Commission Act

and national frameworks. The first Kerala Old-Age Policy (2006) laid the foundation for ensuring basic entitlements, dignity, and health access for older adults. This was later revised as the State Policy for Senior Citizens (2013), incorporating a more rights-based and holistic approach, recognising gender-specific vulnerabilities, the importance of ageing in place, and intergenerational equity. Currently, the draft Kerala State Policy on Ageing (2024) proposes a transformative life-course approach, integrating ageing concerns across sectors and budgets. It draws from global frameworks such as the Madrid International Plan of Action on Ageing, the UN Decade of Healthy Ageing (2021–2030), and India's National Policy for Senior Citizens (2011).

Kerala's draft policy emphasises decentralisation, elder participation in Gram Sabhas, addressing intersectional vulnerabilities, and mainstreaming ageing in disaster management, climate adaptation, and digital literacy initiatives. The draft policy recommends a unified Elder Care Data Platform integrating health, pension, and social care records, geo-tagging of elderly households, especially those living alone, establishing a linked data bank of trained informal caregivers to facilitate access to resources, training modules and support networks for caregivers, generating data on neglect, abuse and violence against older adults, and data bank and support services for older return migrants. Such reforms are critical to operationalise Kerala's vision of equity-focused, data-driven governance for the ageing population.

Simultaneously, the Maintenance and Welfare of Parents and Senior Citizens Act (MWPSC), 2007 has been implemented across Kerala through District-level tribunals. To address gaps in case pendency and real-time monitoring, the Kerala State Elderly Commission Act, 2025 establishes an independent statutory body to regulate institutions, monitor implementation, and safeguard elder rights, a long-standing demand of rights groups and the judiciary.

This policy evolution demonstrates Kerala's commitment to aligning ageing policy with demographic reality, transitioning from reactive to proactive models of social protection.

Kerala State Elderly Commission. The Kerala State Elderly Commission has been constituted in the State under the Kerala Elderly Commission Act, 2025 with the primary objective of protecting, supporting and safeguarding the rights and interests of the senior citizens in Kerala. Kerala is the first State in India to establish an Elderly Commission which will actively address the challenges faced by the elderly population, such as neglect, exploitation, and abandonment. The Commission functions as a quasi-judicial body, with the authority to issue guidelines and recommendations for the welfare and safety of senior citizens. The Commission will facilitate rehabilitation in coordination with the Government and offer legal aid as required. The recommendations of the Commission will be forwarded to the Government for necessary intervention and dispute resolution. This model echoes international best practices such as the Office for Seniors in New Zealand and the National Commissions on Ageing in Canada and South Africa.

Schemes for the elderly

Kerala has introduced a series of pioneering schemes aimed at ensuring the dignity, health, and active participation of older adults.

Vayomithram. Implemented by KSSM, this urban-centric programme provides monthly health check-ups via mobile clinics, medicine distribution, home visits, and counselling to elderly above the age of 65 years residing in urban areas of the State. Currently, 95 Vayomithram units are functioning in the State, operational in 6 Municipal Corporations, 85 Municipalities, and 4 Block Panchayats. The project provides health care and support by conducting free medical check-ups and treatment through mobile clinics. The number of beneficiaries has steadily increased over the years, reaching 2.91 lakh in 2024-25.

Sayamprabha scheme. This is a comprehensive package, implemented by the Social Justice Department, for the creation of elderly-friendly environments, and achieving good physical as well as mental health in the most meaningful way and sustainable manner. The major programmes implemented under the Sayamprabha schemes are:

- Model Sayamprabha Homes, which function as multi-service day care centres for the elderly.
- Vayoposhanam scheme, which provides food kits to ensure the health and nutrition of senior citizens in Sayamprabha day care centres.
- Vayoreksha scheme, which provides emergency first aid, emergency assistance for the treatment, surgery, ambulance service, rehabilitation etc. to the indigent and abandoned elderly.
- Vayoamrutham project, implemented with the support of the Indian System of Medicine for Ayurveda treatment for persons in Government old age homes. Every year, residents of 16 Government old age homes avail benefits of the scheme
- Psycho-social Care in Old Age Homes, provided in association with NIMHANS, Bengaluru.
- Vayomadhuram scheme, through which glucometers were supplied to diabetic elderly people in the BPL category, free of cost.
- Vayosevana Awards, being given to Government/ Non-Government Organisations working in the field of elder care, and also veterans who made significant contributions in the fields of arts, sports, and life time achievers are honoured
- Music therapy and yoga therapy in old age homes.

Other key initiatives. The Sallapam Call Centre and Elderline 14567 provide emotional support, rescue, and legal help; Navajeevan Scheme supports self-employment ventures for older persons (50–65 years) via subsidised loans; Smruthipadham, Kerala's dementia care programme, offers daycare and support in collaboration with Alzheimer's and Related Disorders Society of India; and Karunya Arogya Suraksha Padhathi (KASP) and National Health Mission (NHM) provide tertiary medical insurance coverage. Collectively, these schemes reflect Kerala's shift from a welfare-centric to a capability-building approach in eldercare.

Old Age Pension Scheme. This is a non-contributory pension scheme for low-income citizens aged 60 years and above. Beneficiaries receive a monthly pension of Rs 2,000. As of October 2025, there are 28.8 lakh beneficiaries that receive old age pensions. The Central Government contribution (through the Indira Gandhi National Old Age Pension Scheme) is only Rs 200 per month for persons aged 60-79 years and Rs 500 per month for 80 years and above, and benefits just 3,42,032 and 1,16,781 individuals, respectively. The State meets the remaining requirement for these individuals, as well as the full pension amount for those not eligible for IGNOAPS benefits.

Programmes for the elderly by Kudumbashree. Kudumbashree also plays a pivotal role in elderly care through programmes for (i) elderly inclusion, (ii) destitute rehabilitation (Asraya), and (iii) palliative care. Kudumbashree's innovations include Elderly Neighbourhood Groups that promote inclusion, mutual aid, and dignity; the Harsham Geriatric Care programme, which offers home-based paid services providing medical and emotional support; the Snehitha Calling Bell initiative, which ensures daily check-ins for isolated elders; the Asraya destitute rehabilitation programme, which supports marginalised elderly persons; and the Saanthwanam programme which screens individuals for major risk factors and diseases.

Interventions by Local Self-Governments. LSGs earmark 5 per cent of their total Development Fund exclusively for the welfare and palliative care of the elderly. LSGs implement projects to make all institutions elder-friendly, with measures such as separate queue in hospitals, seating, ramps in offices, elder-friendly toilets and bathrooms, elder-friendly tourist destinations, and initiatives such as Vayo club, Old age home, Pakal veedu, and dedicated Gram Sabhas for seniors, thus promoting civic participation and intergenerational dialogue. LSGs also support the elderly with palliative care, treatment, medication, and nutritious food.

Care Systems and Service Delivery

At the community level, day-care centres (Pakalveedu and upgraded Sayamprabha Homes), managed by LSGs in collaboration with Kudumbashree and civil society organisations, provide opportunities for social interaction, basic health checks, nutrition, and recreation. At the home-care level, palliative care units serve elderly persons annually, especially those bedridden or with chronic illnesses.

At the institutional level, the Department of Social Justice runs old age homes, regulates the operations of such institutions outside Government, and implements schemes for the elderly with increasing attention to dementia-specific needs through the Smruthipadham initiative. In addition to

16 Government old age homes, the Department runs Sayamprabha Homes to provide day care facilities to the elderly, in cooperation with LSGs. It was initiated in 82 LSGs in 2018. LSGs have been running Pakal Veedu for the day care of the elderly, and these were upgraded to Sayamprabha Homes, incorporating recreational activities, health care, and nutritional support for the elderly. The Department also piloted Model Sayamprabha Homes as multi-service day care centres for various needs of the elderly. Apart from the old age homes run by the Department, there are nearly 680 registered old age homes under the Orphanage Control Board. The number of residents in old age homes in Kerala has increased from 19,149 in 2016-17 to 37,895 in 2024-25.

Efforts under the National Programme for Health Care of the Elderly (NPHCE) have supported the establishment of District-level geriatric clinics and 10-bed wards.

The Kerala Care Palliative Grid has been formed in collaboration with Kerala Digital University to coordinate palliative care. All voluntary organisations and associations in the field of palliative care will be made part of the grid. As of August 2025, 2,06,199 patients have been registered in the grid. The Grid includes 1,387 Government institutions and 1,227 NGOs.

K for Care is an initiative of Kudumbashree that provides care services for the elderly, the sick, and people with disabilities, as well as maternity care. It is a community-based initiative aimed at providing professional care services through community members. Kudumbashree has also piloted Harsham neighbourhood groups that train women as domiciliary aides and palliative volunteers.

The demographic transition in Kerala elevates the need to expand and strengthen age-specific healthcare services, particularly through investment in geriatric-specialised human resources. According to 2023 estimates from the Directorate of Health Services and the Kerala Social Security Mission, Kerala has approximately 120 geriatricians, 600 nurses trained in elderly care, 400 physiotherapists, and 50 occupational therapists. To meet projected service needs and align with the WHO's recommended multidisciplinary care model, the State must work toward developing a workforce of nearly 300 geriatricians, 1,500 nurses, 900 physiotherapists, and 250 occupational therapists by 2030. Achieving these targets will position Kerala to effectively address the growing prevalence of chronic and degenerative conditions among older persons. Innovative approaches such as tele-geriatric consultations and mobile medical teams (including the Vayomithram programme) offer significant promise and can be strengthened through focused professional upskilling and closer integration with primary care networks. Expanding medical education, in-service training, and supportive incentive structures, particularly for physiotherapists and nurses, will help advance Kerala's vision of universal, age-appropriate healthcare access.

Additionally, mandated registration of all elder care institutions under a unified digital portal, periodic third-party audits, and a State-wide rating system could help Kerala create a Gold Standard model for dignified institutional elder care.

Living Arrangements, Social Participation and Digital Inclusion

Kerala's robust LSG architecture positions Gram Panchayats to blunt the risks of elderly-only households through neighbourhood-level nutrition schemes, domiciliary physiotherapy, and "virtual family" phone-call programmes interventions. This has been piloted in Thrissur's Arimpur Panchayat with promising reductions in self-reported loneliness.

Community collectives constitute Kerala's signature strategy for active ageing. As of March 2024, the Kudumbashree Mission supported 25,992 elderly NHGs with over 2.8 lakh members, while the Social Justice Department facilitated 2,463 Vayo Clubs. These forums convene weekly for micro-savings, chair-yoga, legal-aid desks and digital-literacy sessions, and they elect representatives to exclusive Vayojana Gram Sabhas, integrating older voices into local-plan formulation. Such initiatives align with two core domains — social participation and civic engagement — of the WHO Age-Friendly Cities framework, demonstrating how decentralised governance can convert demographic ageing into social capital.

Introducing inclusive technology options for the elderly would help in reducing their isolation through the rapid medium of communication and service availability, and in turn help in reduce dependency. Information technology and communications can be effectively utilised in elderly care services. Project Vayoraksha, piloted in Pathanamthitta during the Covid-19 pandemic, showcased how m-Health tools (Mobile technologies that provide health-related services and information, including mobile apps for tracking health data, wearable devices for monitoring vital signs,

and telehealth platforms for virtual consultations) can bridge the digital gap in elderly care. Nearly three-fourths of registered needs, mostly for chronic medicines, were met through the Vayoraksha network, and compliance with reverse quarantine exceeded 75 per cent. The pilot highlights how community mobilisation and tailored digital strategies can enable rapid adoption among seniors, offering a scalable model for integrating technology into Kerala's elderly care programmes.[3]

Gender, Disability and Other Vulnerable Subgroups

Kerala's age pyramid is distinctly female at its apex. Social security transfers such as the State's old-age pensions (reaching 28.8 lakh individuals, both men and women) and widow pensions (reaching 13.2 lakh women) (as on October 2025) remain a critical lifeline for Kerala's elderly, especially elderly women. International best practice points to community-based Older Women Self-Help Groups that blend savings, peer-support and chronic-disease screening; adapting such models through Kudumbashree's elderly neighbourhood groups could simultaneously enhance financial resilience and social connectedness.

Older persons from historically marginalised communities experience the double disadvantages of age and social exclusion. Scheduled Castes and Tribes constitute roughly 14 per cent of Kerala's senior citizens. Pension uptake in remote Adivasi hamlets lags behind the State average.

Coastal elders are similarly vulnerable: dependence on volatile fishing incomes, high occupational injury rates and cyclone exposure translate into elevated NCD prevalence and disability. The Fishermen Welfare Board disbursed old age pensions to 44,560 beneficiaries in 2024-25.

Transgender elders face compounded stigma in housing and healthcare access[4]. The Mazhavillu welfare package offers targeted financial assistance and free follow-up of sex-reassignment surgery, but scheme penetration among transgender elders remains difficult.

Kerala's 2015 Disability Census recorded 7.9 lakh persons with disabilities (2.3 per cent of the population); older adults (60+) comprise just over one-fourth of this cohort. While prevalence mirrors the national average, Kerala's higher life expe ctancy magnifies the need for long-term-care systems. The State channels assistive technology largely through the scheme for providing assistive devices to persons with disabilities through the Kerala State Handicapped Welfare Corporation, LSGs, and the Health Department.

Policy innovations should therefore include designating Sayamprabha day-care centres as inclusive safe spaces for transgender persons, mainstreaming sign-language and dialect translators in Vayomithram outreach, and piloting mobile geriatric clinics in coastal Panchayats.

Covid19 Lessons and Resilience

Kerala entered the Covid-19 pandemic with two structural facts that shaped every subsequent policy decision: it had India's oldest age profile, and a recent history of natural-disaster response that had strengthened local governance networks (LSGs) and community-based organisations (CBOs). Confronted with a pathogen that disproportionately threatened older adults, the State quickly reframed containment, clinical care, and social-protection measures through an explicit age lens. Drawing on global "targeted shielding" theory and Kerala's own experience of flood-relief micro-planning, officials combined reverse-quarantine, granular vaccine micro-plans, and open digital platforms to keep services flowing while minimising exposure.

Reverse-quarantine and vaccination roll-out. Kerala was the first Indian State to mandate "reverse-quarantine" (April 4, 2020), instructing every ward to map and cocoon citizens ≥ 60 years or with comorbidities. Rapid Response Teams drew on Panchayat-level voter lists, ASHA registers, and Kudumbashree neighbourhood groups to create a live "vulnerable persons" roster, colour-coded at household level for police patrols and last-mile delivery[5]. Epidemiological modelling suggests that such shielding reduced contact events among older adults by 35 to 40 per cent during the first wave; Kerala's case-fatality ratio in the 60+ cohort (1.8 per cent in 2020) remained well below the national average of 3 per cent[6]. Beyond infection control, the initiative protected social and mental health: weekly buddy-calls from trained youth reduced self-reported loneliness scores by half, mirroring outcomes seen in community-integrated care models in Taiwan and Japan. When vaccines became available, the same micro-plans morphed into a "red-carpet" campaign. By September 2021, 92 per cent of Kerala's older adults had received two doses one of the fastest elderly coverages in the Global South[7] .

Way Forward

The State has a duty to support and enhance the capabilities of the elderly.

Every elderly person should have access to a safe, comfortable, and age-friendly place to live, whether in

3 Mathew et al., 2024

4 Thelly et al., 2025

5 Observer Research Foundation, 2020

6 Gulia & Kumar, 2020

7 Suchitra ET, et. al.,2022

a personal home or in State- or private care facilities. Living arrangements must be supported by services that sustain functional ability, including nursing care, assistance with daily activities, comprehensive medical care — preventive, curative, and palliative — and counselling. Older persons should also have reliable transport, opportunities for recreation and intellectual engagement, access to information, and guidance on continued employment or voluntary activity. The State will promote the development and use of technologies for ageing. As an initial measure, a comprehensive census of the elderly will be undertaken to guide planning and service delivery.

The welfare, protection, and security of elderly persons in Kerala rest on an approach that moves beyond exclusive reliance on family care towards a community-centred, and rights-based model. In view of the State's ageing population, mandatory allocations for elderly welfare may have to be enhanced.

Investments in decentralised geriatric care infrastructure, targeted livelihood support, and strengthened social protection, especially for the rural elderly, are essential. Priority will be given to expanding community-based and home-based care, alongside a structured system for delivering essential services directly to homes, including pensions, medicines, and ration supplies. Pakalveedu and Vayo Clubs will be expanded as social hubs where senior citizens can participate in recreational activities, access support, and reduce social isolation.

Healthcare systems will be strengthened through the establishment of dedicated geriatric clinics and specialised hospitals, supported by a trained workforce of geriatric caregivers. Key interventions include expanded universal health coverage for older persons, closer integration of elderly health programmes with primary health centres, elder-friendly outpatient services, and increased budgetary support for preventive and palliative care. The landmark decision in the 2026-27 Budget to allocate Rs 50 crore for a Pneumococcal Vaccination Drive for senior citizens is an important step toward making Kerala a leader in geriatric care.

Protecting the rights of the elderly remains central to policy. The establishment of the Kerala State Elderly Commission marks an important step towards a strong institutional framework for legal aid, investigation of abuse, and the issuance of welfare guidelines. Effective implementation of the Maintenance and Welfare of Parents and Senior Citizens Act, 2007 is critical, including streamlined tribunal procedures and timely enforcement of orders. Public awareness campaigns will help reshape social attitudes towards ageing and inform senior citizens of their rights and available support systems.

Kerala's demographic profile generates a strong demand for domiciliary and preventive services and opens significant opportunities in the emerging silver economy. Initiatives such as the Responsible Tourism Mission, which made seventy destinations barrier-free in its first phase in 2023, demonstrate this potential. The care economy in Kerala also presents significant opportunities, as reflected in initiatives such as Kudumbashree's K for Care and Harsham neighbourhood groups. These networks of domestic care workers and palliative volunteers can be formalised as labour cooperatives to strengthen peer governance, enable pooled insurance, and link services with Local Self Government contracts.

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Chapter 10
Scheduled Castes and Scheduled Tribes: Ensuring Inclusive Development

It is a feature of Kerala's Five-Year and Annual Plans that the share of total Plan allocations to the Tribal Sub-Plan (TSP) and Scheduled Caste Sub-Plan (SCSP) have consistently been more than the share of the people of the Scheduled Castes and Scheduled Tribes in the population of the State. From 2016-17 to 2026-27, around 9.81 per cent of total State Plan outlay has been earmarked for Scheduled Caste development, and 2.83 per cent for Scheduled Tribe development. The people of Scheduled Castes constitute 9.10 per cent of the total population, and the people of Scheduled Tribes constitute 1.45 per cent of the total population.

The struggle against caste and other forms of sectional social discrimination and deprivation was a crucial feature of the struggle for social change in Kerala, and social liberation from caste an important aspect of the Kerala renaissance of the late 19th and early to mid-20th centuries. Social policy in Kerala, over the time period covered by this report, reflects a continuous concern with righting the wrongs of history with regard to the injustice and inequities of the caste system and other forms of instutionalised social discrimination.

Over the period of the 13th and the 14th Five-Year Plans, the State has strived to safeguard the Constitutional rights of the people of the Scheduled Castes (SCs) and Scheduled Tribes (STs) and to strengthen their overall social and economic development through a host of specially designed schemes and programmes.

Scheduled Caste Development

Scheduled Castes in Kerala

According to the 2011 Census, the Scheduled Castes population of Kerala is 30.39 lakh, constituting 9.10 per cent of the total population of the State. There are 53 Scheduled Castes communities and 26,342 Scheduled Castes Nagars in the State.[1] The communities such as Vedar, Nayadi, Kalladi, Arundhathiar/Chakkiliar are identified as vulnerable communities among Scheduled Castes, representing 3.65 per cent of the total Scheduled Castes population in the State. SC population is highest in Palakkad district (13.3 per cent), followed by Thiruvananthapuram (12.3 per cent), Kollam (10.8 per cent), Thrissur (10.7 per cent), and Malappuram (10.1 per cent). These five Districts together account for more

Table 10.1 *Allocation to Scheduled Caste Sub-Plan from State Plan, Kerala, 2016-17 to 2026-27* in Rs crore

Year	Total State Plan outlay	SCSP outlay	SCSP outlay as per cent of Total State Plan outlay
2016-17	24,000	2,354.4	9.8
2017-18	26,500	2,599.7	9.8
2018-19	29,150	2,859.6	9.8
2019-20	30,610	3,002.8	9.8
2020-21	27,610	2,708.5	9.8
2021-22	27,610	2,708.5	9.8
2022-23	30,370	2,979.4	9.8
2023-24	30,370	2,979.4	9.8
2024-25	30,370	2,979.4	9.8
2025-26	32,500	3188.3	9.8
2026-27	35,750	3,507	9.8
Total	3,24,840	31,867	9.8

Source: Budget Documents (various years), Finance Department, GoK

[1] Through G.O (Ms) No:16/2024/SCSTD, dated June 18, 2024, the Government of Kerala directed the use of terms such as Nagar, Unnathi and Prakrithi instead of Colony, Settlement, and Ooru to refer to the areas where people of Scheduled Castes and Scheduled Tribes communities reside.

Table 10.2 *Expenditure of Scheduled Caste Sub-Plan funds, 2016-17 to 2025-26 (as on 27.09.2025), Kerala*
in Rs crore

Year	SC Development Department Expenditure**	LSG Expenditure
2016-17	1,116.3	726
2017-18	1,275.3	929.9
2018-19	1,167.4	1,057.7
2019-20	753.9	735.4
2020-21	1,313.3	1,125.9
2021-22	1,290.8	1,082.8
2022-23	1,316.6	1,127.4
2023-24	1,271.3	930
2024-25*	1,346.3	1,141.3
2025-26 (27.09.2025)*	619.4	235.4
Total	11,470.6	9,091.8

Source: Budget Documents (Various Years), Finance Department, GoK, Planspace-State Planning Board, GoK, LSGD Dashboard
Note: *Expenditure Data is from Planspace
**Expenditure of 'Special Central Assistance to Special Component Plan' (Outside State Plan) is not included.

than half of the total Scheduled Caste population in the State (57.2 per cent). The vulnerable communities are mostly concentrated in Palakkad, Malappuram, Kollam, and Idukki Districts.

Allocation and Expenditure of Scheduled Caste Sub-Plan (SCSP) Funds

Each year, a portion of the State Annual Plan outlay is earmarked as Scheduled Caste Sub-Plan (SCSP). Out of total SCSP outlay, around 55 per cent is allocated to the Scheduled Castes Development Department (SCDD) and the remaining 45 per cent is allocated to Local Self-Governments (LSGs).

Kerala set apart Rs 31,867 crore from 2016-17 to 2026-27 as SCSP for the welfare of people of Scheduled Castes. Of this, Rs 17,533.5 crore was earmarked for the SCDD and Rs 14,333.5 crore to the LSGs. The percentage of SCSP flow from total State Plan Outlay was 9.8 per cent in this period, higher than the proportion of Scheduled Castes population. As Plan size increased, the SCSP outlay too has increased (Rs 2,354.4 crore to Rs 3,507 crore).

Turning to outlay and expenditure from 2016–17 to 2025–26, SCDD achieved utilisation rates exceeding 80 per cent in several years except 2018-19 (74.3 per cent), 2019-20 (45.7 per cent) and 2023-24 (77.6 per cent). LSGs, though showing moderate performance in the initial years, significantly improved their utilisation by 2020–21, reaching an impressive 92.2 per cent. The financial year 2019–20, which coincided with the Covid-19 pandemic, recorded one of the lowest utilisation rates- 45.7 per cent for the SCDD and 54.3 per cent for LSGs. Over the entire period under review, the SCDD has utilised 78.3 per cent (Rs 11,470.5 crore) of its allocated funds, while LSGs have spent 71.2 per cent (Rs 9,091.8 crore).

Major Interventions and Achievements during the 13th and 14th Plan Periods

The State has implemented various policies and schemes in the following areas:

- Land and housing
- Education
- Skill development, employment and entrepreneurship
- Social development
- Infrastructure in residential settlements
- Socio-economic survey

Land and housing

The Government has given utmost importance to solve the issue of landlessness and homelessness among the people of the Scheduled Castes. Over the nine-year period (2016-17 to 2025-26), a total of Rs 1,835 crore

Table 10.3 *Expenditure on land and housing schemes by Scheduled Caste Development Department, Kerala, 2016-17 to 2025-26 (as on 27.09.2026)* in Rs crore

Year	Expenditure on land	Expenditure on housing**
2016-17	175.7	409.6
2017-18	178.7	576.6
2018-19	154.7	444.4
2019-20	164.5	132.9
2020-21	143.7	514.7
2021-22	158.6	521.4
2022-23	128.9	473.7
2023-24	127.6	188.7
2024-25	70.6	287.0
2025-26 (as on 27.09.2025)*	43.6	79.2
Total	1,346.6	3,268.2

Source: Budget Documents (various years), Finance Department, GoK
Note: *Expenditure Data is from Planspace
**Includes all the housing schemes under SCSP such as (1) Completion of Partially Constructed Houses, Improvement of Dilapidated Houses and Construction of Padanamuri, (2) Housing Scheme for the Homeless SCs (LIFE Mission) (3) Pradhan Manthri Awas Yojana (Gramin) – (PMAY) SCSP (40% State Share) and (4) Indira Awas Yojana -SCSP (40% State Share) in 2016-17.

was earmarked for the Land to Landless scheme and Rs 4,446.7 crore for housing development schemes. Over the entire period, 73.3 per cent (Rs 1,346.6 crore) of the allocated funds were utilised to provide land for landless SC beneficiaries for the construction of their houses. Similarly, 72.7 per cent (Rs 3,628.2 crore) of the funds allocated were utilised in various schemes formulated for the provision of housing and its improvement.

Land. The Land to the Landless scheme reflects a significant long-term policy commitment to address one of the most entrenched socio-economic deprivations-landlessness. The State provides financial assistance to purchase land for landless Scheduled Castes households under the scheme "Land to landless families for construction of houses". From 2016-17 to 2025-26, the scheme showed robust performance in terms of both financial allocation and beneficiary outreach. From 2016-17 to 2025-26 (as on 27.09.2025), a total of 34,163 families were assisted under this scheme.

Housing. From 2017-18, the construction of new houses was implemented under three phases of LIFE Mission. LIFE Mission, a flagship housing initiative of the Government of Kerala aimed at ensuring safe and dignified shelter for all homeless citizens . [2] The scheme is being implemented through LSGs, leveraging a combination of institutional loans from the Housing and Urban Development Corporation Limited (HUDCO), State Plan grants, and financial support from the Kerala Urban and Rural Development Finance Corporation Limited (KUDFC). Under the LIFE Mission framework, an amount of Rs 4 lakh is allocated per house, of which Rs 1 lakh is contributed by the SCDD. The scheme was operationalised through three distinct phases: Phase I- completion of previously incomplete housing units; Phase II- provision of housing for the homeless who already own land; and Phase III- support for the landless and homeless by providing both land and housing.

As on October, 2025, construction of 1,25,360 houses for Scheduled Castes beneficiaries has been completed under all three phases of the LIFE Mission, including from the additional beneficiary lists, LIFE 2020 list, and Extreme Poverty Eradication Programme (EPEP). In addition to this, 30,575 houses are under construction. This figure demonstrates substantial progress in delivering safe housing to marginalised communities.

[2] For more details on the LIFE Mission, see chapter 28, Initiatives for a New Kerala

Renovation of houses. The Government of Kerala through its scheme called Completion of Partially Constructed Houses, Improvement of Dilapidated Houses and Construction of Padanamuri, provides assistance for the renovation of houses and improving the living conditions. An initiative called SAFE (Secure Accommodation and Facility Enhancement) has been implemented since the financial year 2022-23, aiming at the completion and renovation of houses. Under this scheme, SC families with an annual income of up to Rs 1 lakh, and whose houses were completed after April 1, 2010, are eligible for Rs 2 lakh for the renovation/ maintenance of the houses. Between 2016-17 and 2024-25, SCDD facilitated the renovation of 49,903 houses. Apart from this, the LSGs have also facilitated the renovation of SC community houses.

Education

The Government has given particular focus to the education of SC students and provided a range of educational assistance including pre-matric and post-matric scholarships, financial support for higher education abroad. The scheme Padanamuri has been introduced to reduce dropout rate. A landmark initiative is the establishment of the Palakkad Medical College, which not only enhances access to professional education but also symbolises the State's commitment to educational equity. These programmes collectively aim to create a strong foundation for socio-economic mobility among Scheduled Caste students. Kerala has been successful in reducing the dropout ratio of SC students in school education from 0.26 in 2016-17 to 0.06 in 2023-24.

Between 2016-17 and 2025-26, the SCDD allocated a total of Rs 4,392 crore for educational schemes and interventions, out of which Rs 3,439.5 crore was actually spent, marking an overall utilisation rate of 80.4 per cent. There has been a definitive improvement in fund utilisation in the last decade, from 36.9 per cent in 2016-17 to full utilisation by 2024-25. This expenditure includes all the schemes related to educational development under SCSP such as Educational Assistance, Construction Work of Palakkad Medical College, Purchase of Land for Construction of Building for New MRSs and Hostels, Additional State Assistance to Post Matric Students Scholarship, Post-Matric Scholarship to Scheduled Caste Students (40 per cent State Share), Pre-Matric Scholarship for Scheduled Castes Students in Classes IX and X (40 per cent State Share), Pre-Matric Scholarship to the Children of those Engaged in Occupations Involving Cleaning and Prone to Health Hazards (40 per cent State Share), Management of Model Residential Schools including Ayyankali Memorial Model Residential School for Sports, Vellayani, and Construction of Boy's Hostel (50 per cent Sate share).

Educational assistances. SCDD runs 87 nursery schools, 11 Model Residential Schools, 44 Industrial Training Institutes, 86 pre-matric hostels, 19 post-matric hostels, 7 subsidised hostels, 4 Pre-Examination Training Centres, an Institute for Civil Services Exam Training Society (ICSETS), a Community College in Vadakkancherry, Centre for Research and Education for Social Transformation (CREST) in Kozhikkode and a Medical College in Palakkad for imparting education to Scheduled Castes students. The Government provides various types of educational assistances such as primary/secondary education aid, lump sum grant, monthly stipend, pocket money, tuition fee re-imbursement for unaided school students, special incentive, medical and engineering coaching assistance, pre-matric and post-matric scholarships, overseas scholarships etc. for improving the educational status of Scheduled Castes students.

As seen in Table 10.4, over 4 lakh students received pre-matric scholarships annually between 2019-20 and 2025-26 (as on 27.09.2025). The major part of these scholarships was funded by the State, with the Central contribution varying annually. Likewise, the post-matric scholarships benefitted about 1.4 lakh students annually during the same period. Programmes such as the Ayyankali Talent Search Scholarship, distribution of laptops, Vision-2013 coaching, and initial expenses for medical and engineering students are crucial tools to bridge opportunity gaps.

Unnathi Overseas Scholarship. The Unnathi Overseas Scholarship, a new scheme of Scheduled Castes Development Department, is a merit-cum-means scholarship catering to the higher educational aspirations of the talented and meritorious Scheduled Castes students who wish to pursue post-graduate-level (or above) courses in prestigious foreign universities. Along with facilitating their access to a broader area of knowledge and ensuring bright career prospects, the scholarship helps to widen their global exposure and thereby helps in social mobility. The courses covered under the scheme includes Post-Graduate Degree, Post Graduate Diploma considered equivalent to Post Graduate Degree, M Phil and equivalent programmes, Ph.D. and Post-Doctoral programmes. A total of 225 scholarships are provided annually under three

Table 10.4 *Scheduled Caste students who availed scholarships/assistances, 2019-20 to 2025-26 (as on 27.09.2025), Kerala* in numbers

Educational Assistances	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Pre-matric scholarship (Total)	4,15,721	4,12,772	4,23,552	4,15,171	4,09,821	3,73,769	3,15,131
Post-matric scholarship (Total)	1,45,095	1,81,472	1,41,341	1,35,515	1,37,389	1,34,662	24,131
Additional State assistance to post-matric students	1,45,095	40,689	1,25,767	1,20,759	1,37,389	1,56,140	1,20,985
Ayyankali Talent search scholarship	4,680	6,200	7,504	6,914	6,439	6,500	0
Assistance for studying in other States	4,561	2,819	3,043	365	402	406	3
Assistance for Studying abroad	21	17	105	217	233	211	116
Special Incentives	13,855	26,955	30,044	11,555	12,196	13,682	0
Vision-2013 (Medical and Engineering Coaching)	506	374	383	314	228	549	89
Initial Expenses to those admitted to Engineering/ Medical Courses	590	349	506	591	449	728	0
Distribution of Laptops	1,543	1,371	1,110	1,151	578	1,265	887

Source: Scheduled Caste Development Department

different income categories. In addition, 25 students with an annual family income above Rs 20 lakh will be supported with interest-free education loans by the Kerala State Development Corporation for SCs and STs Ltd.

Study Rooms (Padanamuri). The Construction of Study Rooms (Padanamuri) scheme was introduced in 2017-18 aiming to support Scheduled Castes students studying in various Pre-matric and Post-matric institutions. It represents a well-intentioned, context-sensitive scheme that responds to real infrastructural deficits. Providing a conducive study environment at home is essential as the economic condition of the parents may prevent the arrangements of such facilities. This initiative intends to provide financial assistance of Rs 2 lakh for the construction of an additional room of 120 sq ft to the existing houses of Scheduled Castes Students in Classes V to XII in Government, aided, special, technical schools, or Kendriya Vidyalayas, and whose family/parents have an annual income of up to Rs 1 lakh. Furthermore, the project aims to provide additional facilities such as bookshelf, chair, table, fan, light, computer and computer table. More than 40,000 children have benefitted from this programme.

Palakkad Medical College. Palakkad Medical College is a pioneering initiative of the Scheduled Castes Development Department which creates opportunities for around 70 Scheduled Castes students annually to pursue MBBS. Out of the 1,099 students admitted to the MBBS programme at Palakkad Medical College between 2014-15 and 2024-25, 802 belonged to SC communities.

Employment, Livelihood, and Entrepreneurship

To provide livelihood security to the vulnerable, various job-oriented skilling programmes are being implemented by the Government of Kerala. The analysis of the Training, Employment and Human Resource Development scheme shows that, with a cumulative outlay of Rs 415.0 crore and an actual expenditure of Rs 334.2 crore, SCDD achieved an overall utilisation rate of 80.54 per cent over a nine-year period. During the 13th Five-Year Plan period, the scheme demonstrated commendable momentum and utilisation peaked at 97.5 per cent in 2018-19. During the 14th Plan, 96.1 per cent spending was achieved in 2024-25.

Employment in Government. As per Rule 14 (a) of the Kerala State and Subordinate Service Rules 1958, 10 per cent representation (8 per cent for Scheduled Castes and 2 per cent for Scheduled Tribes) is reserved for people of Scheduled Castes/Scheduled Tribes in Gazetted, Non-Gazetted and Last Grade posts in Government. Annual reviews show that from 2016 to 2024, the representation of SC employees was above their population proportion in all the years. It was consistently above 9.5 per cent except for 2016, where it was 9.4 per cent. The Government of Kerala has been successful in filling backlog vacancies for Scheduled Castes in Government services, with backlog vacancies reducing from 1,120 in 2017 to 267 in 2024. Between 2016 and 2024, 1,707 Scheduled Castes backlog vacancies were filled by the Government through a special recruitment process.

Apprenticeship programmes. An initiative called TRACE (Training for Career Excellence) has been started to provide internships/apprenticeships/ placement training for qualified Scheduled Castes youth to allow them to acquire professional experience. TRACE offers qualified Scheduled Castes youth the opportunity to gain work experience and skill development through apprenticeships/job training over a period of 2 years- in the Government system and in the implementation of various schemes. This initiative holds significant potential for up-skilling technically qualified SC graduates and facilitating their integration into the infrastructure and development sectors. One of the most notable interventions has been the Accredited Engineers programme, which ensured the enrolment of around 300 apprentices. In the Justice, Welfare and Legal Assistance (JWALA) project, 68 law graduates were absorbed as apprentices in 2024-25. Likewise, similar opportunities are provided in various other positions. In 2024-25, 53 Social Workers with MSW qualification, 1,215 SC promoters, and 223 clerical assistants were engaged in SCDD's apprenticeship initiatives.

Self-employment. Self-employment assistance is given to individuals/self-help groups with one-third of the loan as subsidy to undertake self-employment ventures. Likewise, financial assistance of up to Rs 1 lakh is given for unemployed Scheduled Castes youth from families, with an annual income limit of Rs 2.5 lakh, to seek jobs abroad. Over this nine-year period, a total of 2,553 beneficiaries received support under the self-employment subsidy scheme, while a significantly larger 10,093 individuals were assisted in seeking jobs abroad. This rise signals a welcome responsiveness to the aspirations of Scheduled Caste youth to participate in global labour markets, where earning potential is often significantly higher than in local entrepreneurial ventures.

Unnathi Empowerment Society. One major initiative in the realm of employment is the inception of the Unnathi-Kerala Empowerment Society in 2023. It envisions a thriving, inclusive ecosystem empowering vulnerable Scheduled Castes and Scheduled Tribes communities with livelihood opportunities and aims to transform educated Scheduled Caste and Scheduled Tribe youth into both entrepreneurs and employers. This is to be achieved by facilitating the necessary education, skill training, and job/entrepreneurship opportunities with the broader goal of socio-economic development in the changing modern world. The Empowerment Society will support Scheduled Castes and Scheduled Tribes youth groups/co-operatives and individuals in their entrepreneurial endeavours and in the improvement of their livelihood opportunities.

Assistance through the SC/ST Corporation and Federation. The Kerala State Development Corporation for Scheduled Castes and Scheduled Tribes Ltd (known as SC/ST Corporation) implements various income-generating and other welfare programmes designed to meet the needs and aspirations of entrepreneurs from Scheduled Caste/Scheduled Tribe communities These include Beneficiary-oriented Schemes, Multi-purpose Unit Loan, Transport Scheme, Loan to Start-up Entrepreneurs, Loan for Rehabilitation of Return Emigrants, Foreign Employment Loan, Micro Credit Finance System, Laghu Vyavasaya Yojana, Loan for Tribal Entrepreneurs, Women Empowerment Programme for SHGs, Mahilasamridhi Yojana, Professional Service Schemes, Land Purchase Scheme for Agricultural Labourers, and Working Capital Loan to Petroleum Dealers. Schemes such as Education Loan, Foreign Education Loan, Marriage Assistance, Housing loan, and Housing Renovation Loan come under Social welfare schemes. From 2016-17 to 2025-26, the Corporation disbursed an amount of Rs 755.2 crore through schemes meant for assisting Scheduled Castes, and benefited 47,087 people.

Likewise, the Kerala State Federation of SC/ST Development Cooperatives Ltd. (known as the SC/ ST Federation), an apex cooperative federation of the Scheduled Castes and Scheduled Tribes primary co-operative societies, undertakes initiatives for the economic betterment of SCs and STs.

Skill training programmes. In order to help Scheduled Castes youth to secure jobs and to start new enterprises, skill development trainings were conducted in areas such as information technology, automobile, electrical, textile designing, health care, and printing technology through various agencies including KELTRON, KASE, ASAP, and CIPET.

Food Craft Institute, Palakkad. In 2018-19, a Food Craft Institute was started in Palakkad District by the Tourism Department, in association with the Scheduled Castes and Scheduled Tribes Development Departments. It provides training in hotel management to students, and jobs are ensured for the candidates in various institutions under the Tourism Department.

Social Development

The Government gives utmost importance to the social development and empowerment of the people of Scheduled Castes. For achieving that goal, the Government is implementing various schemes.

Healthcare. Over the nine-year period from 2016-17 to 2024-25, the Health Care Scheme registered a total outlay of Rs 400 crore and an expenditure of Rs 425.5 crore, achieving an overall utilisation rate of 106.4 per cent. In terms of reach, the scheme assisted around 1.3 lakh individuals with treatment support during this period. Financial assistance of Rs 2 lakh is also provided as relief on the death of the sole income-earning member of an SC family, as part of the scheme. This assistance was provided to 8,938 families between 2019-20 and 2025-26 (as on 27.09.2025).

Special package for vulnerable communities. Vedar, Nayadi, Kalladi, Arundhathiar / Chakkiliar are the vulnerable communities among Scheduled Castes, and constitute 3.65 per cent of the total Scheduled Castes population in the State. There is a separate scheme in the SCSP for these communities. Under the scheme Development of Vulnerable Communities, the State provides assistance of Rs 10 lakh for the purchase of a minimum of 25 cents of agricultural land; Rs 5 lakh, Rs 6 lakh, and Rs 7.5 lakh in Gram Panchayats, Municipalities, and Municipal Corporations, respectively, to purchase land for house construction; Rs 6 lakh for house construction, Rs 2.5 lakh for house renovation, Rs 3 lakh for the construction of Padanamuri, Rs 40,000 for toilet construction; Rs 3 lakh for taking up self-employment initiatives on an individual basis, and Rs 5 lakh for self-employment initiatives which are started as group initiatives. Apart from individual assistance, the scheme also envisions implementation of the Vulnerable Rehabilitation in Nagar-levels scheme for common works in the various Nagars, similar to the Ambedkar Village Development Scheme.

A micro-planning programme called HOME (Household-Oriented Micro-Planning for Empowerment) has been designed for the comprehensive development of families from the vulnerable communities among Scheduled Castes. The approach is to assess the needs of each family through family-based micro-planning and to devise plans according to their needs with complete participation of these families. Its implementation is conceptualised in 4 phases: house visit- data collection of the families of vulnerable communities included in the Extreme Poverty Survey list; preparation of beneficiary list based on deprivation factors; micro-level plan formulation; and plan implementation and evaluation.

From 2016-17 to 2025-26, Rs 295.6 crore was earmarked for the development activities for the vulnerable communities, and Rs 260.6 crore was spent. Altogether, assistance was provided to 510 beneficiaries for the purchase of agricultural land, and 1,144 families for the purchase of land for house construction during this period. Besides this, assistance was provided for the construction of 1,348 study rooms, 2,440 houses, and 1,443 toilets, and 15 wells. Additionally, 2,312 families received assistance for home repairs during 2016-17 to 2024-25. Assistance for self-employment was given to 173 beneficiaries.

Marriage assistance. Under this scheme, financial assistance is given to Scheduled Caste families to support the marriage of girls. The rate of marriage assistance was enhanced from Rs 50,000 to Rs 75,000 in 2016-17. It has been further enhanced to Rs 1,25,000 in 2021-22.

In 2016–17, more than 10,500 families were supported and the expenditure even surpassed the outlay. This positive trend continued through to 2021–22, where over 99 per cent of the allocated funds were utilised, benefitting over 11,000 families. The Marriage Assistance scheme has extended support to 73,757 beneficiaries during the period between 2016-17 and 2025-26 (as on 31.08.2025) with an expenditure of Rs 569.6 crore.

Legal services. The Government of Kerala shows its commitment to protecting the Constitutional rights of Scheduled Castes. It strives for the strict implementation of the Protection of Civil Rights Act, 1955 and the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989 by allocating the required resources. Special Courts, Scheduled Castes Protection Cell, and Special Police Stations have been formed in

the State for the trial of offences and provision of relief and rehabilitation to the victims of atrocities. As part of the strict implementation of the PoA Act, one legal councilor in each District, one legal advisor, and three call centre assistants at State-level were appointed to hear atrocity complaints, find solutions, take steps for the timely provision of compensation assistance, give victims necessary legal assistance, and create awareness against atrocities.

Inter-Caste marriage assistance. The Inter-Caste Marriage Assistance initiative witnessed robust performance during the 13th Five Year Plan period (2017–2022), with annual beneficiary figures generally remaining above 1,400 and peaking in 2021–22, when 2,650 families were supported, the highest in the entire timeframe. Over the period from 2016–17 to 2024–25, a total of 12,906 couples availed Inter-Caste Marriage Assistance. Expenditure on the scheme was Rs 95.4 crore.

Vinjanwadis. Vinjanwadis in Scheduled Caste Nagars include facilities such as libraries, reading rooms, computers with internet facilities, newspapers, journals and periodicals, and necessary furniture. At present, there are 200 Vinjanwadis functioning in the State.

Infrastructure in Residential Settlements

Dr Ambedkar Village Development Scheme. In order to provide better infrastructure facilities, the Ambedkar Village Development Scheme was launched in Scheduled Castes Nagars where more than 25 Scheduled Castes families reside. It aims to create model villages by ensuring targeted and holistic development of Scheduled Caste-dominated habitations. As part of the scheme, Rs 1 crore is provided to each Nagar to undertake various developmental activities including the provision of drinking water, toilets and sanitation, waste management, road connectivity, electrification, land protection walls, irrigation, playgrounds, community halls, renovation of houses, financial support for income-generating activities, and assistance for protection and renovation of burial grounds inside/adjacent to the Nagar.

During the period between 2016–17 and 2025–26, a total of 951 villages were selected under the Ambedkar Village Development Scheme. Work in 420 villages are complete, with a cumulative expenditure of approximately Rs 314 crore.

Activities under Corpus Fund for SCSP. Scheduled Castes Development Department annually earmarks a portion of its outlay as a Corpus fund to fill critical gaps identified in Scheduled Caste Sub-Plan schemes. The Corpus fund is intended to provide funds to address any critical gap in the SCSP provision under various schemes, on project basis with emphasis on human resource development, improvement of basic amenities, and economic development of the people of Scheduled Castes communities. One-third of the total amount earmarked for the Corpus Fund is allocated to Districts for implementation. Administrative sanctions for projects up to Rs 25 lakh can be accorded at the District-level by the District-Level Committee for Scheduled Castes/Scheduled Tribes, and projects above Rs 25 lakh is implemented with the approval of State-Level Working Group.

Between 2016–17 and 2025–26 (upto 27.09.2025), the scheme had a cumulative outlay of Rs 829.1 crore and an actual expenditure of Rs 498.2 crore. From a physical progress perspective, 643 projects have been completed since 2019-20.

Socio-Economic Survey

Home Survey, a flagship initiative of the Scheduled Castes Development Department, is to conduct a comprehensive and accurate data collection of the Scheduled Castes population in Kerala. The main objective of the survey is to gather reliable and accurate data on the demographic, socio-economic, and cultural profile of the Scheduled Castes population as the planning and implementation of programmes for their development and welfare must be based on accurate data. The survey enabled through a digital platform makes it possible to understand the real needs of the people, to collect data on various aspects of their lives, and to update in a very fast and time-bound manner. The survey is in its final stage.

Scheduled Tribe Development

In Kerala, the development of Scheduled Tribes continues to be a central focus of the State's social and economic policies. The economic strategy for Scheduled Tribes emphasises reducing disparities by enhancing access to education, healthcare, employment, and sustainable livelihoods. Through targeted initiatives such as the Tribal Sub-Plan (TSP) and special measures for Particularly Vulnerable Tribal Groups (PVTGs), the State seeks to empower Scheduled Tribes while addressing their distinct socio-economic challenges, ensuring their active participation in economic development. The Government's commitment to inclusive and sustainable growth is evident in policies that integrate traditional practices with contemporary aspirations, promoting both social justice and economic equity.

Kerala is home to 37 Scheduled Tribes communities, which account for 1.45 per cent of the State's population (Census, 2011). According to the latest survey by the Scheduled Tribes Development Department, the total Scheduled Tribes population stands at 4,88,386 individuals across 1,47,868 families, residing in 6,578 Unnathis. The largest tribal populations are concentrated in Wayanad (34 per cent) and Kasaragod (17 per cent) Districts. Among these communities, five are classified as Particularly Vulnerable Tribal Groups (PVTGs) namely Kadar, Kurumba, Kattunaikan, Koraga, and Cholanaika.

Allocation and Expenditure of Tribal Sub-Plan (TSP) Funds

The Tribal Sub-Plan (TSP) allocations in Kerala between 2016-17 and 2026-27 provide an instructive case study of how targeted funding frameworks evolve within the State planning architecture. With a cumulative TSP allocation of Rs 9,199.6 crore against a total State Plan outlay of Rs 3,24,840 crore, the State has demonstrated a policy of sustained financial commitment to the development of Scheduled Tribe communities. The allocation, anchored at 2.8 per cent of the State Plan outlay, is higher than the percentage of the tribal population.

The division of TSP resources between the STDD (76.6 per cent) and LSGs (23.4 per cent) further highlights the State's dual emphasis on departmental and decentralised intervention and execution. The distribution ratio has remained unchanged during the period, supporting the continuity of major schemes and empowering LSGs to implement community-specific interventions.

As the Plan size increased from 2016-17 to 2026-27, the TSP outlay too has increased (Rs 682.7 crore to Rs 1,012 crore). The cumulative expenditure was Rs 6,263.4 crore from 2016-17 to 2025-26(as on 31.08.2025), 76.5 per cent of the outlay. STDD's expenditure in this period was Rs 4,886.2 crore (77.9 per cent of its outlay), and of LSGs was Rs 1,377.4 crore (71.9 per cent of their outlay).The remarkable overall utilisation of 101.5 per cent in 2020-21, during the peak of the Covid-19 crisis, demonstrates the capacity of the system to perform when planning, prioritisation, and field-level responsiveness align.

Major Interventions and Achievements during the 13th and 14th Plan Periods

The State has implemented various policies and schemes in the following areas:

- Land and housing
- Education
- Social security
- Skill development, Employment and livelihood
- Infrastructure

Table 10.5 *Allocation to Tribal Sub-Plan from State Plan, Kerala, 2016-17 to 2026-27* in Rs crore

Year	Total State Plan outlay	TSP outlay	TSP outlay as per cent of Total State Plan outlay
2016-17	24,000	682.7	2.8
2017-18	26,500	751.1	2.8
2018-19	29,150	826.2	2.8
2019-20	30,610	866.3	2.8
2020-21	27,610	781.4	2.8
2021-22	27,610	781.4	2.8
2022-23	30,370	859.5	2.8
2023-24	30,370	859.5	2.8
2024-25	30,370	859.5	2.8
2025-26	32,500	920	2.8
2026-27	35,750	1,012	2.8
Total	3,24,840	9,199.6	2.8

Source: Budget Documents (various years), Finance Department, GoK

Table 10.6 *Expenditure of Tribal Sub-Plan funds, Kerala, 2016-17 to 2025-26 (as on 31.08.2025)*
in Rs crore

Year	Expenditure by ST Development and other departments	Expenditure by LSGs	Total expenditure
2016-17	529.6	109.7	639.4
2017-18	533.8	135.8	669.5
2018-19	502.1	151.3	653.4
2019-20	428.1	110.5	538.6
2020-21	626.1	167.1	793.1
2021-22	579.4	164.3	743.7
2022-23	607.9	173.6	781.5
2023-24	393.6	140.1	533.7
2024-25	454.8	171.6	626.4
2025-26 (as on 31.08.2025)	230.8	53.4	284.2
Total	4,886.2	1,377.4	6,263.5

Source: Budget documents, STDD, LSGD dashboard
Note: The expenditure from 2016-17 to 2023-24 does not include the expenditure of the scheme, Special Assistance to Tribal Sub-Plan (outside State Plan).

Land and housing

One of the top priorities of the Government of Kerala has been to provide land and housing for Scheduled Tribes communities. According to the Tribal Resettlement and Development Mission (TRDM), as of May 2016, the State had 10,748 landless Scheduled Tribe households, accounting for 7.3 per cent of the total ST population. This figure has declined to 6,242, constituting 4.2 per cent of the ST population, in August 2025.

Tribal Resettlement and Development Mission (TRDM). TRDM represents a strategic intervention to address structural marginalisation through land resettlement and socio-economic development. Between 2016–17 and 2025–26, the programme received a total allocation of Rs 495.3 crore, against which expenditure was Rs 328.0 crore.

Land to the landless Scheduled Tribes is provided through the Land Bank Scheme, Land Purchase, Distribution of Reserved Forest Land, Forest Rights Act, and Revenue Land Distribution. From 2016-17 to 2024-25, 4,467 families were given title deeds for 6,183 acres of land, as per the Forest Rights Act. Title deeds were given to 213 families for 48.3 acres of revenue/project/farm land, and 3,426 families were given title deeds for 2,106.2 acres of reserved forest land. In addition, 149 acres of land were purchased for 274 families through Land Purchase, and 66.5 acres of land were purchased for 368 families under the Land Bank Scheme. Flood-affected families (171) have been rehabilitated with the purchase of 20.5 acres of land. Thus, during this period, a total of 8,573.5 acres of land has been allotted to 8,919 families. Furthermore, an amount of Rs 5 crore has been allocated in the financial year 2025–26 under the Wayanad Development Package to compensate 141 workers of the Mariyanad Estate, facilitating the resolution of the long-pending issue of land distribution to over 2,000 members of Scheduled Tribes. Thiruvananthapuram has become the first District in the State to have no landless Scheduled Tribe families.

Housing. Between 2016-17 and 2025-26, the STDD has spent Rs 718.1 crore to provide housing to 13,303 ST families under various housing schemes including the HUDCO Housing Scheme, the General Housing Scheme, and the Vanbandhu Kalyan Yojana Housing Scheme.

In addition, STDD is implementing the new Secure Accommodation and Facility Enhancement (SAFE) program to repair, complete, and renovate unfinished houses constructed post-2010. Under this scheme, Rs 2.5 lakh is provided to ST beneficiaries. Priority is given to families affected by floods, those

Table 10.7 *Expenditure for land distribution under TRDM, 2016-17 to 2025-26 (as on 31.08.2025)* in Rs crore

Year	Expenditure
2016-17	45.1
2017-18	44.4
2018-19	15.2
2019-20	24.6
2020-21	39.0
2021-22	48.9
2022-23	67.9
2023-24	26.3
2024-25	11.4
2025-26 (as on 31.08.2025)	7.5
Total	328.0

Source: Scheduled Tribes Development Department, TRDM

identified in the Extreme Poverty Survey 2021-22, and families identified through the e-survey for micro-plan preparation.

LIFE Mission. The Livelihood Inclusion and Financial Empowerment (LIFE) Mission has been instrumental in the domain of inclusive housing, particularly targeting historically marginalised ST communities, 2017-18 onward. Its purpose is to provide proper and secure housing as a foundation for social and economic empowerment. A total of 88,348 ST beneficiaries were identified under various phases of the Mission; out of which, 80,109 STs were found eligible, 53,497 agreements were executed, construction of 45,976 houses were completed, and 7,521 are under construction (as on November 2025). (For more details on the LIFE Mission, see Chapter 28, Initiatives for a New Kerala)

Education

From 2016-17 to 2024-25, the Scheduled Tribes Development Department allocated a cumulative outlay of Rs 1,097.93 crore for education, and had a Rs 910.6 crore expenditure.

The education initiatives have played a significant role in the overall development and empowerment of Scheduled Tribe communities. Proactive interventions in the school education of ST students have reduced the dropout rate substantially, decreasing from 2.2 in 2016–17 to 0.6 in 2023–24. The major achievements in the education sector over the past nine years, from 2016-17 to 2025-26, are outlined below.

Pre-matric and post-matric scholarships. During the 13th Five-Year Plan and the opening three years of the 14th Five-Year Plan, the Pre-Matric Scholarship scheme benefited 94,336 ST students, and the Post-Matric Scholarship Scheme was extended to 1,38,603 ST students.

Special incentive to brilliant students. A total of Rs 8.3 crore has been expended towards awarding special incentives to 14,276 ST students who achieve high grades or marks in SSLC, Plus Two, Degree, Postgraduate, and professional courses, including research.

Ayyankali Memorial Talent Search and Development. An amount of Rs 3.6 crore was spent over nine years to support to 12,295 meritorious ST day-scholars enrolled in Classes 5 to 10.

Assistance for study tour to school and college-going students. Since 2016–17, Rs 4.1 crore has been spent to support 4,907 ST students' participation in educational excursions and study tours.

Assistance to orphans. A total of Rs 8.8 crore was spent on 4,750 orphaned ST students. This includes educational and living support until they attain adulthood or become financially self-reliant.

Supply of laptops to students. Laptops were distributed to 2,668 students from 2016-17 to August 2025, at an expenditure of Rs 12.5 crore, to address the issue of digital divide.

Assistance for studying abroad. Financial and logistical support was provided to 66 ST students pursuing higher education in universities outside the State, including foreign universities

Vidhyavahini. Between 2016–17 and 2025–26, around 2,10,080 ST students living in remote forest areas, with limited accessibility and inadequate transportation, have been provided transport support under the Vidhyavahini Scheme.

Lump sum grant, stipend, pocket money. Financial assistance in the form of lump sum grants, stipends, and pocket money, has been given to 6,82,653 ST students, with a cumulative expenditure of Rs 164.2 crore.

Educational Institutions under STDD. The educational institutions established and managed by the STDD form a foundational pillar to bridge the educational and socio-economic divide experienced by ST communities. STDD has established a total of 175 educational institutions across various levels, including 2 ITI/VTI centres, 12 post-matric hostels, 2 single teacher schools, 22 Model Residential Schools, 106 pre-matric hostels, and 31 model pre-schools, reflecting an inclusive approach to educational empowerment through a wide-ranging institutional framework.

Social security initiatives

Marriage assistance. The provision of marriage assistance and inter-caste marriage assistance reflects a vision of equity, on one hand, mitigating the economic pressures that accompany marriage ceremonies in low-income tribal communities on the other. It also advances the constitutional goal of social justice by incentivising inter-caste marriages. Marriage assistance scheme (funded under the Plan head) has benefited 3,558 families from 2016-17 to 2025-26.

Health and food security. Between 2016-17 and 2024-25, the STDD undertook a series of health programmes to address long-standing disparities in healthcare access and outcomes among tribal populations. In the 13th and 14th Five-Year Plans, total outlay of Rs 384.5 crore was provided with an expenditure of Rs 349.3, a utilisation rate of 90.8 per cent. The range of interventions, from treatment assistance and mobile medical camps to targeted schemes like the Sickle-Cell Anaemia Support Programme and the Janani Janmaraksha maternal health initiative, demonstrates an integrated approach that responds to both general and specific health vulnerabilities.

The 13th Plan period marked a phase of accelerated health investment, characterised by increasing budgetary allocations, strategic over-spending particularly during crisis years from 2019-20 to 2021-22, and wide-reaching programme coverage. The apex of this outreach occurred in 2021-22, with over 56,000 individuals receiving treatment assistance and nearly 4,000 mobile camps conducted as a coordinated response to the compounded effects of the Covid-19 pandemic and residual impacts from earlier disasters such as the 2018 floods.

STDD's ability to deliver specialised health interventions, such as, the Comprehensive Tribal Health Programme, financial assistance for sickle cell anemia patients, Janani Janmraksha (addressing nutritional needs of pregnant women and adolescents), financial aid to tribal healers, the Kaithang Scheme (supporting orphaned children), KATADI (Kerala Accelerated Tribal Ability Development and Inclusion Initiative) and running of mobile medical clinics to provide healthcare in remote areas, drove significant gains in the landscape of tribal public health. Cumulatively, from 2016 to 2025, treatment assistance has been given to 2,95,009 beneficiaries, 7,139 patients received assistance for Sickle Cell anaemia, 85,301 received Janani Janmaraksha benefits, and 24,283 mobile medical camps were conducted.

However, Kerala's tribal health challenges are deeply intertwined with spatial, infrastructural, and cultural barriers, particularly in Districts such as Wayanad,

Box 10.1
Comprehensive Action Plan for Improving the School Education of Scheduled Tribes Children

To address the challenges faced by Scheduled Tribes students in school education, the State Planning Board, in collaboration with the Departments of Scheduled Tribes Development, General Education, and Local Self-Government, has created a comprehensive action plan. The objectives of this initiative include ensuring universal enrolment of Scheduled Tribes students, improving their retention in schools, increasing their pass percentage and enhancing both grades and the quality of education.

In 2024-25, the programme was piloted in selected schools of Wayanad, with plans to expand it State-wide after evaluating the outcomes. Currently, activities related to this programme are being carried out in 22 schools in Wayanad District. The project is being implemented based on the action plan prepared by the State Planning Board and the Department of General Education.

Idukki and Palakkad. In this context, the health programmes of STDD offer both a foundation for targeted, equity-based health governance and a mirror reflecting the limits of top-down policy in addressing granular, field-level realities.

In the past, the tribal areas of Kerala faced significant challenges in accessing basic healthcare services due to geographical isolation, limited transportation, and a lack of healthcare infrastructure. After the introduction of mobile medical clinics, the Government could address this issue by providing direct access to healthcare services at the doorstep of tribal communities. Through conducting regular health check-ups, delivering vaccinations, and other preventive interventions to reduce communicable diseases, organising targeted healthcare programmes, facilitating community participation, ensuring the distribution of essential medicines, and providing maternal and child health services, mobile medical clinics have played a vital role in strengthening healthcare access and outcomes among tribal communities.

Health institutions. The network of health institutions under STDD show the State's commitment to tribal healthcare. With 43 institutions including an Ayurveda hospital, 17 Ayurveda dispensaries, 3 mobile medical units, 14 mobile clinics, 3 midwifery centres, 5 outpatient clinics and other dispensaries, a layered approach to address the multi-faceted health needs of the Scheduled Tribes is demonstrated.

Notably, the emphasis on integrating Ayurveda through dedicated hospitals and dispensaries is a culturally sensitive intervention, particularly in tribal settings where traditional systems of medicine enjoy greater legitimacy and trust. This alignment with indigenous health practices can be a powerful means of community engagement and health promotion, provided it is adequately resourced and linked with modern health services.

Food security and nutritional development programmes. To address malnutrition and poverty among Scheduled Tribe communities, the Government has introduced a range of food security initiatives. These include the distribution of food grains during the monsoon season, the establishment of community kitchens for vulnerable groups, and the implementation of various agricultural development projects. Targeted programmes such as the Millet Village initiative and the Nutrition Sufficiency Programme have been launched in Attappady to tackle specific nutritional challenges. Additionally, to enhance the nutritional well-being of tribal individuals aged 60 and above, food kits containing essential items have been distributed. The innovative Haritharashmi project, implemented in Idukki and Wayanad, further aims to strengthen food security and improve nutrition in these tribal regions.

Haritharashmi. The Haritharashmi project, launched by STDD in collaboration with the Centre for Management Development (CMD), aims to promote sustainable agricultural practices among Scheduled Tribe communities by utilising under-used land in Idukki and Wayanad. The initiative has benefited over 4,113 individuals across 376 tribal Unnathis and around 163 farmer groups. It offers a comprehensive support system that includes awareness campaigns, hands-on training, seed distribution, and market linkage. Key components of the project include the cultivation of diverse crops, promotion of markets, organisation of harvest festivals, and the establishment of community markets- contributing to both economic empowerment and food security in these regions.

Millet Village Programme. The Millet Village programme was initiated in 2017 to address nutritional deficiencies among the tribal communities in Attappady by promoting the cultivation and consumption of millets, their traditional staple food. Since the project's inception, millet cultivation has been revived in 96 tribal settlements, including the Irula, Muduga, and Kurumba tribes, successfully reintroducing millets into the community's daily diet. In 2019-2020, as the Millet Village project concluded, the Rebuild Kerala Initiative adopted it and launched the Attappady Tribal Comprehensive Sustainable Agricultural Development Project with a fund of Rs 8 crore. During the year 2023-24, 2,003 hectares across two seasons were cultivated.

Namuth Vellame. The Namuth Vellame programme for nutrition-sufficiency in food through agro-ecology has supported 1,315 farmers in Attappady, spanning 1,887.3 acres of cultivated land across 41 Unnathis. By reclaiming fallow land and promoting sustainable agricultural practices, the initiative has significantly improved food security while also contributing to the economic upliftment of the tribal farming community.

Skill development, employment and livelihood

As part of the Government's efforts to address unemployment among ST youth, STDD has implemented several career guidance camps and skill training programmes. The Department's efforts have resulted in successful placements of trained ST youth in both the Government and private sectors, including multi-national companies abroad. The high points of

the programme, particularly in 2017-18 and 2020-21, demonstrate the initiative's potential when aligned with adequate planning and responsiveness to labour market needs. The near-total placement rate in 2017-18, with 1,393 of 1,430 trainees placed in domestic jobs, is a clear indicator that skilling programmes, when efficiently executed, can catalyse meaningful socioeconomic mobility. Similarly, the training of 1,600 individuals during the pandemic year of 2020-21 highlights the Department's resilience and capacity to adapt during crises. From 2016 to 2025, 6,566 ST youth attended skill training courses, out of which 4,047 have been placed in India and 22 have been placed aboard.

The other key initiatives in skill development and employment include the Training for Career Excellence (TRACE) programme, WINGS, and JWALA (Justice, Welfare and Legal Assistance). The TRACE programme provides ST youth a unique opportunity to enhance their employability through job training, skill development, and work experience within Government departments for up to two years. STDD also provides scholarships for pilot training through the WINGS programme, enabling ST students from Kerala to access employment opportunities in international airports and related aviation sectors across the country. The initiative has also supported the training of the State's first ST cabin crew member. The JWALA programme has been a crucial initiative in providing practical legal training to Scheduled Tribes law graduates.

Recruitment of Scheduled Tribes through PSC. Kerala stands out for its proactive approach to recruiting through the Public Service Commission. Between 2016–17 and 2023–24, the Government of Kerala undertook systematic efforts to enhance the representation of Scheduled Tribes in public service in both general and special recruitment. During this period, a total of 9,663 ST candidates were appointed-5,785 through general recruitment and 3,878 through special recruitment.

A significant increase in recruitment is observed in 2022–23 and 2023–24, with over 1,000 appointments made each year in general and special recruitment. Overall, the recruitment data reflects Kerala's sustained efforts to promote equity and social justice in public employment.

Kerala Tribal Plus. The Kerala Tribal Plus scheme stands as a noteworthy policy innovation that strategically enhances the scope of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) by offering an additional 100 days of wage employment to ST families, raising the total to 200 days per year.

From 2018-19 to 2024-25, the scheme has made tangible strides in employment generation, recording an impressive 73.4 lakh person-days of work. Through this initiative, 2,00,275 families had more than 100 days of employment and 22,809 families fully utilised the entitlement of 200 days. The steady expansion in coverage, from 21,178 families in 2018–19 to 34,843 in 2024–25, shows a positive trajectory of outreach and engagement with the tribal populace.

Equally significant is the State's financial commitment to sustain the programme. The cumulative expenditure of Rs 204 crore over the seven years signals

Box 10.2
Sahyakiran and Marayoor Madhuram

Sahyakiran. The Sahyakiran initiative, launched by the Centre for Management Development (CMD) with funding from the Kerala's Scheduled Tribes Development Department, aims to revitalise traditional tribal occupations in Kerala. Covering eight Districts, it supports occupations like Marayoor jaggery production, bamboo and cane handicrafts, mat and carpet weaving, forest honey processing, and the collection of medicinal plants and non-timber forest products). CMD provides training and equipment for the scientific collection and processing of these products. Sahyakiran directly employs 700 tribal individuals and the programme indirectly benefits 2,100 people, fostering skill development and sustainable livelihoods in tribal communities.

Marayoor Madhuram. As part of the revitalisation of traditional Marayoor Jaggery, a GI-tagged product, the Marayoor Jaggery production plant was established in Dundi Kombu, Marayoor. The project started by organising 150 beneficiaries into a single Self-Help Group, which later led to the creation of the Marayoor Kanthalloor Tribal Farmers Producer Company, marking a pioneering initiative for empowering Kerala's tribal communities. The project was rolled out on August 30, 2024 under the brand Marayoor Madhuram.

Source: Centre for Management Development, 2025

the serious policy intent to translate constitutional guarantees into practical entitlements. The correlation between financial inputs and rising employment outcomes points to the scheme's potential as an effective redistributive instrument, especially in contexts of entrenched disadvantage where landlessness, seasonal joblessness and spatial marginality converge to produce chronic poverty.

Infrastructure

Ambedkar Settlement Development Scheme. The Ambedkar Settlement Development Scheme is being implemented to address the urgent needs of Scheduled Tribe communities residing in designated tribal settlements across the State. The project focuses on improving infrastructure, promoting economic development activities, and meeting the essential needs of women and children. Under the scheme, 94 settlements were selected during the year 2017–18 for infrastructure development. Of these, 77 Unnathis/ settlements have achieved 100 per cent completion of all planned works. Additionally, a total of 167 Unnathis were selected between 2021–22 and 2024–25 for infrastructure development.

Micro-Plan. A community-based empowerment strategy, the Micro-Plan, has been formulated as a strategic roadmap for the development and sustainable management of tribal Unnathis in Kerala. There are 6,578 tribal Unnathis across the State, and a customised Micro-Plan is developed for each, based on their specific needs and priorities. As part of the project implementation during 2023–24, data were systematically collected from 54 Nagars to inform and guide the planning process.

Edamalakudi special package. Under the Edamalakkudi Special Package, an allocation of Rs 13.7 crore was made for the construction of a 7.7 km road between Pettymudi and Idaliparakkudi, of which 4.5 km has been completed to date. Presently, efforts are ongoing to develop essential infrastructure in Edamalakkudi, including the provision of drinking water, electricity, internet connectivity, additional road networks, and related amenities.

Corpus Fund for TSP. The Corpus Fund, from 2016-17 to 2024-25, had a cumulative outlay of Rs 424.9 crore and an expenditure of Rs 351.1 crore.

Way Forward for Scheduled Caste and Scheduled Tribe Communities

Way Forward

The way ahead is for a complete modernisation of the sources of employment for the people of Scheduled Castes and Scheduled Tribes. The peoples of Scheduled Castes and Scheduled Tribes must be full and equal participants in the acquisition of tertiary education and skilling, which enables a complete transformation of the means of livelihood. To this end, continuous advances will be made in the standards of living and means of higher education available to the people of Scheduled Castes and Scheduled Tribes. The State will continue to strengthen the institutional infrastructure to protect the civil, social, and economic rights of the people of the Scheduled Castes and Scheduled Tribes.

Chapter 11
Food Security and the Public Distribution System in Kerala

The Government of Kerala has ensured food security by means of a universal food security system. It has protected working people and the economically vulnerable from the effects of inflation. In this regard, an important policy of the Government of Kerala has been to control the prices of 13 essential commodities. Taken together with the public distribution system, this is an important step forward in ensuring that the people of Kerala have access to a range of vital commodities.

The food security and public distribution system in Kerala is a comprehensive network designed to ensure food security and the equitable distribution of essential commodities. It serves as a cornerstone of Kerala's social welfare initiatives. Kerala's Public Distribution System (PDS) is notable for its effectiveness in providing food grain and other essential items at subsidised rates to millions of families, particularly those below the poverty line. Kerala maintains the system effectively by ensuring universal access to food and increasing the efficiency and transparency of the distribution process, with an emphasis on marginalised and vulnerable populations. From ration shops and fair price outlets to technological advancements such as biometric authentication, the system is regularly updated and refined to enhance its reliability.

Kerala has a historic legacy of ensuring food security through its well-planned Public Distribution System. The first Government after the formation of the State of Kerala initiated the distribution of rice at subsidised rates to lower-income groups in 1957, and continued until the mid-60s, when the Public Distribution System (PDS) was officially extended (on July 1, 1965).

Food security as defined by the United Nations Committee on World Food Security, is said to exist when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The six pillars of food security are availability, access, utilisation, stability, sustainability, and agency. The UN declared its aim to achieve zero hunger a Sustainable Development Goal. In line with the UN declaration, the Government of Kerala has announced actions to achieve a hunger-free State.

NFSA Implementation

The Government of India enacted the National Food Security Act (NFSA) 2013 to ensure the availability of subsidised food grain to approximately two-thirds of India's population. One of the first steps the Government of Kerala undertook on assuming office in 2016 was the implementation of NFSA in the State, with effect from November 1, 2016. The erstwhile Planning Commission (now NITI Aayog) determined the State-wise coverage of PDS under NFSA by using the NSS Household Consumption Survey data of 2011-12. The coverage in Kerala was fixed at 52.6 per cent in rural areas and 39.5 per cent in urban areas; in effect, 1,54,80,040 people in Kerala are eligible for PDS under NFSA. Kerala strictly adheres to the objective of the Act which is, "to provide for food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity". The State has implemented other major reforms in PDS including doorstep delivery of food grain, the application of Information and Communication Technology (ICT) to ensure transparency at all levels and prevent diversion of grain, leveraging Aadhaar for unique, biometric identification of beneficiaries, and ensuring transparency of records and monitoring the schemes, in order to ensure food security for the targeted beneficiaries.

Based on policy changes made by the Government of India, Targeted PDS (TPDS) was introduced in 1997. Under the TPDS, beneficiaries were classified on an economic basis into three categories: Above Poverty Line (APL), Below Poverty Line (BPL), and Antyodaya Anna Yojana (AAY). In 2001, the Annapoorna scheme was introduced in which 10 kg of rice was provided per month, free of cost, to destitute individuals above age 65. With the launch of NFSA, the categories of BPL and APL were ended, and "priority" and "non-priority" categories were introduced. Under the priority category, there are Priority HouseHold (PHH) cards, and the poorest of the poor hold Antyodaya Anna Yojana (AAY) cards, However, this resulted in the exclusion of nearly 1.6 crore of the State's population that were previously covered. To counter this, the Government of Kerala went beyond the prescribed limited NFSA coverage and introduced two other types of ration cards for those categorised as non-priority: Non-Priority Subsidy (NPS)- households that are not covered under NFSA but are eligible for certain State subsidies; and Non-Priority Non-Subsidy (NPNS)- households that

are neither eligible under NFSA nor entitled to State subsidies, but can use their ration card to seek services from ration shops and Kerala State Civil Supplies Corporation (Supplyco) outlets.

The implementation of NFSA coincided with the renewal process of existing ration cards in the State. The Government of Kerala adopted a mark-based, State-specific ranking system to identify NFSA beneficiaries. A call for the voluntary surrender of priority cards from ineligible card-holders was issued, following which, 3,39,437 priority ration cards were surrendered. Kerala was the first State to undertake such a mission. The State also ran a screening programme, Operation Yellow, to identify ineligible individuals in the priority category with the help of the public, transfer their cards to the general category, and to include eligible families in the priority category. Under this operation, 17,596 priority cards were found ineligible and Rs 4.2 crore collected as fines. The process of renewal, deletion, and addition of new cards continues.

Kerala has distinguished itself by moving beyond NFSA beneficiary identification and has implemented universal PDS coverage. The State has undertaken targeted measures to identify and provide ration cards to marginalised and vulnerable populations, including transgender persons, and the extreme poor.

Public Distribution System

Food security has been achieved in Kerala through the implementation of a transparent, equitable, and universal public distribution system. Kerala is a State with a deficit in food production. Of the total requirements of food grain, 15 per cent is produced in the State. For vegetables too, there is reliance on neighbouring States. While the State depends on central allocations for food grain, it provides an additional and significant food subsidy to the target population. In addition to food grain disbursed through ration shops, 13 essential commodities are sold through Supplyco outlets at prices 30 per cent lower than open market prices. The Centre for Price Research Kerala monitors prices of these 15 essential commodities at the State-level, provides recommendations, and assists the Government in formulating policies to control and regulate the prices of essential commodities, thereby safeguarding consumer rights. Major objectives of the Public Distribution System in Kerala are:

- **Food security.** Ensure access to safe and nutritious food for all, especially for vulnerable and economically disadvantaged individuals.
- **Price stability.** Regulate the prices of essential commodities to protect consumers from market fluctuations.
- **Equitable distribution.** Provide essential commodities at subsidised rates to ensure affordability for everyone.
- **Nutrition support.** Improve the nutrition of the entire population, with a focus on children, pregnant women, and senior citizens.
- **Efficient management.** Streamline storage and distribution processes to minimise wastage and ensure timely availability. This is achieved through the use of Aadhaar authentication and smart ration cards to minimise leakages, and regular monitoring and transparency to improve beneficiary satisfaction.

Institutional network of PDS

Kerala's PDS, functions under the Commissionerate of Public Distribution and Consumer Affairs, and is a robust establishment with 14 District Supply Offices, 83 Taluk Supply Offices, and a network of 13,858 ration shops. Several agencies are involved in ensuring the effectiveness of the PDS. The Department of Food and Civil Supplies is responsible for issuing ration cards to beneficiaries, promoting consumer awareness, and ensuring the availability of essential commodities through its network of PDS outlets. The other major agency involved is the Kerala State Civil Supplies Corporation Ltd. (Supplyco), which is designated as the nodal agency for implementing NFSA 2013 in the State. Supplyco is engaged in facilitating the storage and transportation of food grain through its intermediate godowns, providing transport services, and managing the distribution of food grain. Additionally, Supplyco intervenes to bring price stability in the open market by selling essential commodities at subsidised prices.

In 2025, the State had 26 Food Corporation of India (FCI) sub-depots, 793 Maveli stores (up from 950 in 2016), 549 super markets (there were 401 in 2016), 112 Maveli Super Stores (up from 23 in 2016), 21 Mobile Maveli stores, 39 People's Bazaars (26 in 2016), 87 Maveli Medical Stores (105 in 2016), 6 Hyper-Markets. Additionally, the State has established 3 LPG outlets, 1 Kerosene depot, 1 Premium In & Out store, and 1 Apna Bazaar.

The major activities of the Public Distribution System in recent years include the following.

- The National Food Security Act, 2013, has been implemented in the State since October 2016.
- Door-to-door delivery of ration items was started on March 9, 2017.

- The mobile ration shop for Scheduled Tribe hamlets started on July 14, 2017 at Thrissur. This has since been extended to Thiruvananthapuram, Pathanamthitta, Ernakulam, Idukki, Malappuram, Palakkad, Kozhikode, Kannur, and Wayanad.
- The State-level inauguration of the use e-PoS (Point-of-Sale) machines in ration shops was started on January 6, 2018.
- The Hunger-free Kerala project was launched in Alappuzha on August 4, 2019. This has since been expanded to Kottayam and Thrissur.
- The distribution of free food kits to all categories of cardholders during the Covid-19 pandemic through ration shops commenced on April 27, 2020.
- The pilot project of the e-ration card scheme was started on February 12, 2021. This has since been extended to all the Districts.
- The distribution of Aadhaar-based ration cards had been implemented.
- The public can monitor ration distribution on a real-time basis through the Department portal.
- A Public Grievance Redressal System for PDS has been launched in the State.
- The computerisation of the Public Distribution System has been effectively implemented.

Ration cards

As of March 31, 2025, Kerala has 94.9 lakh valid ration cards, which include both NFSA and non-NFSA categories. The NFSA category includes 5.9 lakh Antyodaya Anna Yojana (AAY) cards, for the poorest of the poor, and 36.3 lakh Priority Household (PHH) cards. The non-NFSA category includes 22.3 lakh Non-Priority Subsidy (NPS) cards 30.1 lakh Non-Priority Non-Subsidy (NPNS) cards and 0.3 lakh Non Priority Institution (NPI) cards. Different colours are assigned to different categories of cards: AAY cards are yellow, PHH are pink, NPS are blue, NPNS are white, and NPI are brown. Another key reform involved issuing the ration cards in the name of the eldest woman of the household, naming her the head of the household.

Each family with an AAY card is eligible for 30 kg of rice and 5 kg of wheat per month. Earlier, the Union Government supplied food grain at a subsidised rate of Rs 3 per kg for rice and Rs 2 per kg for wheat. The State Government further subsidised these costs and provided the food grain free of cost to AAY beneficiaries. Since 2023, the Government of India has been supplying food grain free of cost to AAY cardholders.

Each PHH card-holder family is eligible for 5 kg of food grain per month. The Government of India supplies rice at Rs 8.3 per kg for non-priority cardholders (NPS and NPNS). However, the Government of Kerala provides rice to NPS cardholders at a further subsidised rate of Rs 4 per kg.

In addition to the supply of grain, the Government of India has permitted the conversion of a specified amount of wheat supply to *atta* for APL cardholders from 2006. Since 2020, this has been extended to AAY and PHH cards. A specific quantity of rice is allocated to NPNS cards at prices significantly below market prices.

The State also issues Non-Priority Institution (NPI) cards to institutions such as destitute homes and orphanages. Another special category is those eligible for the Annapoorna scheme, in which 10 kg of food grain is given free of cost to destitute individuals above the age of 65 year, who lack sufficient means of subsistence.

Table 11.1 *Beneficiaries by ration card type, March 2025*

Category of card	Number of beneficiaries	Share of beneficiaries by card type (%)
ANNAPOORNA	44	0.00013
AAY	18,03,110	5.3
PHH	1,24,22,790	36.3
NPS	89,78,016	26.2
NPNS	1,10,05,210	32.1
NPI	28,864	0.1
Total	3,42,38,034	100

Source: Civil Supplies and Consumers Department

Of ration beneficiaries in the State, 36.3 per cent belong to households holding PHH cards, 5.3 per cent to households with AAY cards, and the remaining 58.4 per cent are covered under State-issued non-priority cards (NPS, NPNS, and NPI).

The total food grain distribution through PDS in 2024-25 was 13,69,148 MT, which includes 2,41,204.6 MT to AAY cardholders, 7,52,918 MT to PHH cardholders, and 3,75,025.4 MT to non-priority cardholders.

By providing subsidies more extensive than the Central assistance under NFSA, and ensuring the universal provision of rations rather than limiting it targeted provisioning, the State ensures food security for all. A substantial financial commitment continues to be made to ensure this.

Polyvinyl Chloride ration cards (SMART Cards). A new type of ration card, SMART card, was introduced in 2021 to makes portability easier. The SMART card enables the integration of the ration card with all IT-enabled services; all ration cards in Kerala are now fully Aadhaar-seeded

Ente Ration Card app. Developed by NIC and the Civil Supplies Department, this Android app (and soon iOS) lets users view ration card details (card type, family members, monthly entitlements), track application status, access fair price shop (FPS) information, download digital copies of the card, and receive notifications.

Proxy facility in ration cards. This facility allows a designated person (proxy) to collect ration items on behalf of the card-holder or beneficiary**,** particularly when the card-holder is unable to visit the ration shop due to age, disability, illness, or absence.

Give Up programme. This programme encourages eligible families to voluntarily surrender their subsidised ration benefits, helping redirect those resources to more deserving and economically weaker households**.**

Allotment, Lifting and Off-take of Food Grain through PDS

In 2024-25, 1,43,908 MT of wheat was allotted to the State for PHH cardholders, and the same quantity was lifted to Fair Price Shops(FPSs). The off-take from FPSs was 1,41,664 MT. The allotment of rice to the State for PHH cardholders was 6,09,010 MT, with the same amount lifted. The offtake was 6,05,675 MT.

Off-take in the PDS refers to the quantity of grain drawn by an individual household against its monthly entitlement.

Supply Chain Management and Doorstep Delivery

The State Government has entrusted Supplyco as the authorised agency and system integrator for supply-chain management and doorstep delivery of food grain (from intermediary State-owned godowns to the doorstep of Authorised Ration Dealers (ARDs)). To track the movement of food grain and detect any leakage, the Vehicle Tracking and Fleet Management System (VTFMS) was piloted in 2022. GPS tracking of transportation and the installation of Closed-Circuit Television (CCTV) cameras at the entry and exit points of godowns is being done across the State in a phased manner.

Under the National Food Security Act, 2013, the Government of India must bear 50 per cent of the financial assistance for intra-State movement, handling of food grains, and FPS dealers' margin- limited to priority card holders. The Union Government has fixed the cost of distributing one quintal of food grain to priority households at Rs 65, of which Rs 32.5 is borne by the Centre. In contrast, the average cost of door-to-doorstep delivery in Kerala is Rs 185 per quintal, covering vehicle hire, loading and unloading, godown rent, staff salaries, and other expenses, including distribution to both priority and non-priority households. The balance amount of Rs 152.5 per quintal is borne by the State Government. The State spends an average of Rs 21 crore per month through Supplyco for doorstep delivery to FPSs; in 2024–25, this amounted to Rs 223.6 crore, against Union assistance of Rs 32.1 crore.

Similarly, the Union Government has fixed Rs 107 per quintal as FPS dealer's margin (a basic margin of Rs 90 and an additional margin of Rs 17), applicable only to priority card holders. However, the average cost of doorstep delivery through FPSs in Kerala is Rs 320 per quintal, covering distribution to both priority and non-priority households. Of this amount, the Union Government contributes Rs 53.5 (50 per cent of Rs 107, as fixed by the Government of India), while the remaining Rs 266.5 is borne by the State Government. The Government of Kerala spends around Rs 34 crore per month on FPS dealer margins; in 2024–25, this amounted to Rs 260.8 crore out of the Rs 313.6 crore spent in the State.

Lower Food Expenditure and Higher Protein

A notable feature of consumption in Kerala, relative to other States, is the high protein intake despite a lower food share in consumption expenditure. This is true for both rural and urban areas of the State, and implies

the existence of a robust food security system, and well-being of the people in the State.

According to Nutritional Intake in India (2022-23 and 2023-24) published by the National Statistics Office, the average per capita daily protein intake of rural Kerala in 2023-24 was 73.9 gm, against an all-India average of 61.8 gm. Similarly in urban areas in Kerala, average per capita daily protein intake was 72.4 gm against an all India-average of 63.4 gm, in the corresponding period. Kerala has the highest protein intake among major States.

Source-wise analysis of protein intake indicates that people in Kerala derive a significant share of their protein from high-value foods such as eggs, fish, and meat. The percentage break-up of protein intake by food group across major States shows that Kerala has the highest contribution eggs, fish, and meat - 38.2 per cent compared to the all-India average of 12.4 per cent in rural areas, and 37.8 per cent compared to 14.1 per cent in urban areas.

Data from 2023-24 show that out of the total Monthly Per Capita Consumption Expenditure (MPCE), the share spent on food (and cereals) was 41.4 in rural Kerala and 37.4 in urban Kerala, the lowest among major States, while the national averages are 49.3 per cent and 41.1 per cent, respectively.

Policy Transformation of PDS

To achieve the objective of a hunger-free Kerala, multiple strategies were planned during the 13th Five-Year Plan period, with a primary focus on strengthening the PDS and improving nutritional outcomes through enhanced access, quantity, and nutritional quality of food. This period coincided with the implementation of the NFSA 2013, and emphasised key initiatives such as NFSA implementation and end-to-end computerisation. In this period, the need for rigorous analysis of food security and nutrition gaps was recognised, alongside the necessity of interventions in staff training, beneficiary awareness, and empowerment, with the roadmap for implementation laid out and activities initiated.

The 14th Five-Year Plan (2022-2027) envisaged further improvement of PDS to provide quality food grain at the right time, right quantity, and as per entitlements, meeting nutritional standards, and with hassle-free delivery.

The following section details the steps taken by the State Government towards policy transformation over the past decade.

Initiatives to improve access to PDS. The State has made concerted efforts to ensure universal ration by extending coverage to non-NFSA beneficiaries. The State also initiated programmes to address issues of physical access to ration shops. A Mobile Ration Shop scheme has been initiated to deliver ration to tribal communities in hilly, remote, and difficult-to-reach areas. These mobile ration shops are currently operational in 142 tribal hamlets, across 10 Districts. The scheme is being extended to all tribal habitations and labour settlements in the State.

Implementation of intra and inter-State portability. The intra-State portability of entitlements, introduced through NFSA, enables beneficiaries to access food grain from any shop within the State. FPS licensees are also incentivised to improve service delivery to attract beneficiaries outside their FPS coverage area.

As proposed by the Government of India, One Nation One Ration Card (ONORC) has been implemented in the State for guest labourers from other States to avail ration benefits. States/UTs participating in the national portability cluster can obtain food grain from other States within the cluster through Aadhaar-authenticated e-PoS transactions. Kerala began national portability transactions in January 2020. The introduction of SMART cards has facilitated easy portability.

Social audit. In compliance with NFSA, the Government of Kerala has introduced social audits to promote transparency, prevent pilferage, and identify and address gaps in the PDS. The Government entrusts credible organisations to conduct the audit. With increased consumer awareness, public participation in the audit process is also expected to improve. Vigilance committees at the State, District, Taluk, and Fair Price Shop (FPS) levels have also been reconstituted.

Fair Price Shops — Standardisation, automation, and transformation. Grain and other supplies are distributed through Fair Price Shops (FPSs) owned and managed by Authorised Ration Dealers (ARDs). At present, there are 13,858 FPSs in the State. All FPSs in the State underwent a major facelift and were painted in a uniform colour code of yellow and red. An FPS is required to display the stock and price list of commodities, as well as samples of the available stock. The Government of Kerala also proposed a project to financially support FPS owners to enhance the floor area of shops. One of the significant reforms undertaken

is the automation of FPS through the introduction of electronic Point-of-Sale (ePoS) devices. Kerala has successfully implemented e-PoS across all FPSs in a time-bound manner. Other reforms being implemented in a phased manner include the installation of CCTV cameras at FPS, and linking automatic weighing scales with e-PoS machines. Once a weighing scale is linked to the e-PoS machine, the bill will be printed only when the exact amount of allotted food grain is weighed and given to the beneficiary, ensuring full delivery of entitlement and zero leakage of food grain.

It is envisioned to establish Model Fair Price Shops in all Local Self-Governments (LSGs) in the State, under the management of cooperatives or Kudumbashree self-help groups. Shop space with adequate storage to hold two months of food grain stock will be provided by the respective co-operative societies or LSGs. The Department has also implemented a programme to make FPS financially viable by providing them with additional business avenues beyond PDS distribution, including certain banking and citizen-centric services in line with the Common Services Centers (CSC) services. Other services, such as the retail sale of small (5kg) LPG cylinders and the sale of other commodities or general store items, can also be undertaken.

Grievance redressal mechanism. An online grievance redressal mechanism was initiated to register and track grievances. A call centre and toll-free helpline numbers established for the Targeted Public Distribution System (TPDS) under the Kerala State IT Mission (KSITM) continue to function. Grievances can also be registered through email. As per the provisions of the Kerala Food Security Rules, 2018, the Government of Kerala has designated the Additional District Magistrate and Deputy Collector (General) of each District as the District Grievance Redressal Officer under Section 15 (1) of the NFSA, 2013, for the expeditious and effective redressal of grievances in matters relating to distribution of entitlements. The State also runs an annual programme, Thelima, from November 15 to December 15, for card-holders to rectify errors in their cards. Transparency is further ensured as the monthly allotment to a card is notified on the registered phone number at the beginning of the month. The category-wise allotment for the month is also notified on the websites of the State Food Commission.

State Food Commission. The Government of Kerala has constituted the State Food Commission in accordance with Section 16 of NFSA, 2013. The Commission conducts regular visits to various stakeholder units, including FPS, NFS godowns, Nutrimix production units, anganwadis, and schools, to ensure the efficient implementation of the Act's provisions.

Other Initiatives for Food Security and Nutrition

Open market intervention by Supplyco. The Kerala State Civil Supplies Corporation Ltd (Supplyco), established in 1974, is the Government agency tasked with market intervention to stabilise prices of essential food and consumer goods.In addition to the PDS, the State Government provides essential items at subsidised rates through Supplyco outlets to mitigate the impact of inflationary trends in the open market. Supplyco has been effectively involved in stabilising the prices of essential commodities. For 13 commodities, including pulses, grain, rice, *atta*, and sugar, the price was fixed between the years 2016 and 2024 at a price around 30 per cent lower than in the open market. After 2024, the rates were marginally increased, but still maintaining the 30 per cent difference.

Supplyco is also engaged in the retailing of more than 6,000 fast-moving consumer goods at an average price that is 20 per cent lower than in the open market. Supplyco markets its own branded products under the name Sabari, which includes curry powder, coconut oil, tea, and coffee. Supplyco runs 793 Maveli stores, 112 Maveli Super Stores, and 549 Super Markets. Apart from these, Supplyco also operates 6 Hyper Markets, 21 Mobile Maveli Stores, and 39 People's Bazaar outlets. Additionally, Supplyco organises special fairs in festival seasons and at school opening season to meet increased consumer demand. To improve the reach of Supplyco, its products are now being distributed through K-Stores. The supply of commodities to ration shops and institutional meal programmes like Mid-Day Meals are also undertaken by Supplyco.

K- Store. K-Store was started on May 14, 2023, as part of the diversification of Fair Price Shops with facilities for mini-banking, utility bill payments, LPG sales, and telecom products within ration shops, with the aim of upgrading 1,000 shops in the first phase. K-Stores also supply subsidised essential commodities, Chottu gas, Supplyco's own Sabari products, MILMA, products of various PSUs, delivery of IT-based services. This is a way to convert Fair Price Shops into a lifeline for

the general public, providing an array of public utility services under one umbrella. As on August 2025, there are 2142 K-Stores are functioning.

Hunger-free Kerala. Kerala has initiated measures to end hunger in all its form in the State by 2030. The Government has started a scheme to provide one free meal a day for the needy. In line with State Government policy, several Local Self-Governments have directly initiated schemes to cater to the needy.

Janakeeya Hotel. Janakeeya Hotels are a flagship element of Kerala's Hunger-Free Kerala strategy, successfully delivering affordable meals and empowering women-run enterprises at scale. This programme was launched in the Kerala during 2020–21, with the vision was to establish 1,000 Janakeeya Hotels — one in every LSG — to provide nutritious meals at Rs 20 with the aim of ensuring food security among poor, homeless and marginalised populations. These were scaled up during the Covid-19 pandemic, evolving from emergency community kitchens into formal enterprises run by local Kudumbashree women's groups. At its peak, over 1,100 to1,198 Janakeeya Hotels operated across Kerala by 2022, serving between 40,000 to 70,000 meals daily. This project was managed by Kudumbashree groups, each unit received a revolving fund (up to Rs 50,000) to set up infrastructure (cooking utensils, basic billing system). The groups were provided Rs 10 per meal subsidy from the State, enabling sale at Rs 20 per lunch or Rs 25 per parcel. The groups were provided rice at subsidised rates (Rs 10.90/kg) via civil supplies. The rent, electricity, and water expenses of the hotels were covered by LSGs. Kudumbashree is transforming community kitchens in rural hamlets into Nutrition Education Centres, using traditional food knowledge, wild edible plants, tubers, millets, legumes, and cooking demonstrations to re-establish healthier local food habits and raise awareness about safe, nutritious diets, especially among elder women.

Subhiksha Hotel. Subhiksha Hotels were introduced which provide affordable meals at Rs 30 per meal. Other food items are also sold at subsidised rates in these hotels. There are currently 47 Subhiksha hotels in the State, and over 3.5 lakh people benefit from Subhiksha hotels every month.

Distribution of ragi through FPS. The year 2023 was declared the International Year of Millets by the Food and Agriculture Organisation (FAO) to raise awareness about the health and nutritional benefits of millets. Following this, the Government of India directed the States to celebrate 2023 as the Year of Millets. The Government of Kerala took steps to include ragi in PDS and has distributed ragi through ration shops from June 2023. Ragi obtained from FCI was converted into ragi flour and distributed to AAY and PHH card-holders through ration shops in packets of 1 kg- for Rs 8 for the AAY category and Rs 10 for the PHH category. The distribution of ragi powder was mainly targeted at tribal areas in the State.

Nutrition needs of vulnerable groups. Kerala's nutrition strategy for the needs of vulnerable populations blends targeted schemes (such as Mission POSHAN 2.0 and revised anganwadi menus) with community-run solutions (such as community kitchens, pothichoru schemes), and universal delivery (ration kits). The major initiatives under the scheme includes: Mission POSHAN 2.0, which aims to improve supplementary nutrition delivery and strengthen convergence across health and education sectors to tackle malnutrition among vulnerable groups such as children under five, girls, pregnant and lactating women; enhanced anganwadi nutrition menu, revamped by Kerala in to include egg biryani, pulao, and other nutritious rotations, replacing traditional upma, after community feedback; and nutrition for older adults and pandemic response, in which Kerala placed focus on the nutritional status among older populations to improve resilience during Covid19. The joint Health and Kudumbashree Grand Care programme provided nutrition delivery and medication to the elderly at home, helping reduce infection and mortality rates.

Tribal nutrition programmes in Kerala. Kerala has several distinct initiatives in tribal areas. These include community kitchens in tribal hamlets, to provide three meals daily to vulnerable groups: children, adolescent girls, pregnant and lactating women, and senior citizens; 100-Days programme for Paniya Tribals; Oorinte Tharattu project in Attappady, to tackles neonatal mortality linked to malnutrition in tribal hamlets; and Comprehensive Tribal Health Care components, which includes Nutrition Rehabilitation Centres.

Nutrition for adolescent girls. Programmes include the Scheme for Adolescent Girls (SAG), a centrally sponsored scheme to improve nutrition, health, awareness, life skills, and education for girls aged 11–18 years; Kishori Sakthi Yojana (KSY), focusing on supplementary nutrition; Mission POSHAN 2.0, an integrated nutrient intervention under the Poshan Abhiyaan merging anganwadi nutrition, SABLA, and adolescent nutrition efforts; and Vanithanayam, a 2024 programme which ensures nutritious meal to adolescent girls.

Health and nutrition initiatives. The Government launched the 1,000 days programme, recognising the critical nature of the period beginning with the first day of a woman's pregnancy (which lasts 270 days) to the child's second birthday (730 days from birth). The programme includes the supply of therapeutic food, awareness classes to reduce child mortality rate, and regular medical camps for pregnant and lactating women. The project was initiated in Attappadi on a pilot basis, and was extended in 2022-23 to 42 Integrated Child Development Services (ICDS) projects in coastal and hilly areas.

Nutrition clinics have been initiated to promote the health of women, children, and adolescents through nutritional counselling, guidance, referrals, and other social support services, all under the guidance of a registered nutritionist. The project aims to assess an individual's overall dietary health and identify the risk of malnutrition in its initial stages, intervening before the person becomes malnourished. Nutrition Clinics have been set up in 152 Blocks and 6 Municipal Corporations.

Mid-Day Meal programme. Kerala's Mid-Day Meal programme is one of the best-implemented in India, focusing not just on feeding children but also on ensuring nutritional quality, hygiene, and inclusivity. It plays a vital role in the State's education and food security system, particularly for vulnerable children.

Kerala provides hot, cooked, nutritious meals, often exceeding the national calorific and protein norms. Meals include rice, pulses, vegetables, eggs, and occasionally milk or fruits. The menu is diverse and locally adapted, ensuring both nutrition and taste. It includes regional dishes that are familiar to children. The scheme is jointly funded by the Union and State Governments. Kerala contributes a higher share, ensuring better quality and reach. Kudumbashree women's self-help groups are responsible for cooking and distributing meals in most schools. Nearly 25 lakh children benefit from the scheme. Eggs and milk are included in the menu every week, for protein intake. Kitchen gardens are introduced in schools to promote self-sufficiency in vegetables.

Integrated Child Development Services (ICDS). Kerala's ICDS is one of the most extensive in the country, delivering integrated nutrition, health, education, and care services via a vast anganwadi network. This is a flagship early childhood development programme launched nationwide in 1975, aiming to combat malnutrition and support holistic child growth through six core services at anganwadi centres. In Kerala, ICDS is implemented via 33,120 anganwadis, each serving children aged 0–6 years, and pregnant and lactating women, offering supplementary nutrition, growth monitoring, pre-school education, immunisation referrals, and health-nutrition education. Kerala pioneered the distribution of milk and egg on all days in all anganwadis, benefiting approximately 4 lakh children aged 3–6 years across the State.

Between NFHS 4 (2015–16) and NFHS 5 (2019–21), Kerala's prevalence of underweight children decreased, and the proportion of severely malnourished children under age 6 covered by ICDS rose from 56 per cent to about 63 per cent. This strengthens early childhood development and nutritional security. De-worming, nutrition education, and referral services are the important programmes for adolescent girls. Pregnant and nursing women receive antenatal and postnatal care, supplementary food, and weight monitoring.

Nutrition programme for ITI students. The Government of Kerala operates a nutrition programme for Industrial Training students. Under this scheme, protein-rich noon meals are provided to 6,352 trainees at 34 ITIs, including 14 women ITIs. Boiled egg, banana, brown bread, and other nutritious food, along with one glass of milk, are supplied to 17,381 trainees in the remaining 74 ITIs. This scheme also provides breakfast and dinner to the trainees residing in ITI trainee hostels of Attappady, Aryanadu and Nilambur.

Programmes under the Kudumbashree Mission. Kudumbashree has woven food and nutritional security into its core mission via a comprehensive model: empowering women to cultivate, process, and market food, while reviving collective farming and promoting organic, healthy diets. This has reduced dependency on external food supply chains, strengthened local resilience, and uplifted thousands of women via sustainable livelihoods. Major initiatives of Kudumbashree units in Kerala for ensuring food security include:

Food-secure homes (Bhakshya Suraksha Bhavanam). This programme mobilises neighbourhood groups (NHGs) to cultivate vegetables on small plots or grow-bags (minimum 3 cents per group or 5 grow bags per person). This programme was launched State-wide in August 2017, and has empowered over 20 lakh families to grow their own vegetables, improving household nutrition and reducing dependency on external sources.

Organic and safe food cultivation. Since 2004, Kudumbashree farmers have been cultivating organic

rice, fruits, and vegetables across about 60,000 Joint Liability Groups (JLG), in efforts to steer Kerala towards food self-sufficiency and pesticide-free produce.

Nutritional enterprises and ICDS collaboration. Kudumbashree runs 241 microenterprises producing Amrutham Nutrimix, a micronutrientfortified food supplement distributed through ICDS anganwadis to young children, adolescent girls, and pregnant/lactating women. These are strictly quality controlled, with support ranging from procurement of raw materials to processing protocols and packaging machinery.

Kudumbashree Maa Care kiosks in schools. provide children with nutritious snacks, drinks, stationery, and sanitary napkins within the school premises. The initiative is being implemented in collaboration with the General Education Department. The project began in Kasaragod and Kannur Districts and is now extended to Idukki, Pathanamthitta, and Malappuram. The project's intention is to eliminate the need for children to leave school during class hours.

Eat Right Kerala app. This State-wide initiative by the Kerala Food Safety Department was inaugurated on June 7, 2023, coinciding with World Food Safety Day. The innovative digital tool launched by Kerala's Food Safety Department as part of the Nalla Bhakshanam Nadinte Avakasham campaign connects consumers with hygiene-certified eateries, facilitates complaint redressal, and enhances overall food safety awareness. The Eat Right Kerala app awards hygiene star certificates to hotels that comply with the approximately 40 food safety and hygiene standards.

Role of PDS in Crisis Response and Management

Over the past decade, Kerala has experienced several crises. While some were localised in nature, such as the Nipah virus outbreak and the disaster in Mundakkai, others affected larger areas and more populations, as during the Ockhi cyclone, and the 2018 and 2019 floods. The global Covid-19 pandemic, on the other hand, affected the entire population. During such crises, one of the primary relief measures undertaken by the State is to ensure the provision of food grain, free of cost, to affected populations through the PDS network. Following the landslide at Mundakkai, Wayanad, in 2024, the State Government distributed food kits through FPSs to the card-holders in the landslide-affected areas.

During the Covid-19 lockdown, for the first time in the history of the State's PDS, more than 97 per cent beneficiaries availed their ration allotments. Over 87 lakh families received kits stocked with essentials such as pulses, oil, sugar, soap, and spices, reaching over 78.6 lakh kits per month on average. Expenditure amounted to approximately Rs 4,198.3 crore. Kits were distributed via more than 14,242 civil supplies stores, and LSGs ensured home delivery when needed. During this time, assistance was also provided to over 70,000 guest workers across the State, including in plantation regions. In this period, Onam food kits with 14 grocery items were also provided to ration card-holders. In addition to these measures, students up to the primary level who are covered by the mid-day meal scheme were given provisions and rice kits. Around 26,26,110 students in Government and aided schools across the State benefited from the scheme. Fish workers affected by the trawling ban were also provided with food kits during the pandemic. The engagement of grassroots-level workers, including Kudumbashree, ASHAs, and anganwadi workers in the distribution of ration and kits ensured access to these support measures when mobility was restricted.

Challenges

Kerala has consistently ensured food security to its population through its universal rationing system, even before the introduction of NFSA. Kerala ranks first among the States on the Sustainable Development Goal (SDG) India Index 2023-24, with the highest score among the States (84) in SDG 2, Zero Hunger. The national score for this Goal is 52.

The nutrition interventions undertaken in the State, as detailed, include PDS, the mid-day meal scheme in schools, and supplementary nutrition through anganwadis under ICDS. While the rice and wheat distributed under PDS can fulfil certain macro nutritional requirements. Periodic revision of nutritional content is essential for meals provided to children under the Mid-Day Meal Programme, supplementary nutrition and take-home rations provided to children under three years of age, and cooked meals provided to children aged three to six years through anganwadis under the ICDS. A statutory monitoring mechanism is required to ensure the effective implementation of adequate nutrition for pregnant women, lactating mothers, and infants from socially disadvantaged sections of society under the First 1,000 Days of Life programme.The coverage of the Hunger-Free Kerala Project, which provides at least one meal free or at subsidised rates to the needy, can be improved with from the help of LSGs.

Table 11.2 *Performances of Kerala and India in SDG 2 Zero Hunger*

Indicators	Kerala	India	Target
Beneficiaries covered under NFSA, 2013(%)	100	99	100
Children under 5 who are under weight (%)	19.7	32.1	13.3
Children under 5 who are stunted (%)	23.4	35.5	23.7
Pregnant women (15-49) who are anaemic (%)	31.4	52.2	25.2
Women (15-49) whose BMI is below 18 (%)	10.1	18.7	7.7
Rice and wheat produced per unit area (kg/ha)	2,882.2	3,052.3	5,322
GVA in agriculture per worker (lakhs/worker)	2.28	0.86	1.22
Total Score	84	52	100

Source: SDG India Index 2023-24

Changing food consumption patterns

The shift in food consumption patterns in the State, driven by factors such as rising purchasing power, exposure to new cuisines due to migration, local availability, and changing demographics, needs to be acknowledged as it may affect demand for rice through the PDS. It is important to assess how these changes vary across income groups, particularly in light of differential off-take among cardholder categories. Expenditure on meat, poultry, and processed foods now accounts for around 45 per cent of food consumption expenditure, though access to these foods varies significantly by income level.

Nevertheless, the incidence of overweight and obesity has increased between NFHS 4 and 5 from 29 to 36 per cent among men, and from 32 to 38 per cent among women. There is also an increased incidence of non-communicable diseases such as diabetes and hypertension. With the increasing elderly population in the State, the changes in dietary needs must be addressed in the PDS.

Two forms of public awareness need to be strengthened: awareness of entitlements under the NFSA, and awareness of the importance of nutrition. Beneficiaries must be informed about category-specific entitlements, as well as provisions such as portability, proxy facilities, and available grievance redressal mechanisms to improve service access. The Department uses multiple platforms including radio, television, print, and social media to raise awareness, with additional efforts to reach migrant populations in their own languages. The wide beneficiary base and reach of PDS should also be leveraged to promote nutrition and food basket diversification, in coordination with agencies such as the Health Department, ICDS, and LSGs.

Since Kerala has historically been a consumer State, ensuring food security requires not only the provision of food subsidies but also increased agricultural production and strengthened supply chain management.The promotion of indigenous varieties of food crops is also essential. Wider promotion and adoption of programmes such as Subhiksha Keralam, which was introduced during the pandemic to boost agricultural production and allied sectors through a collaborative approach involving farmers, youth, repatriated NRIs, Kudumbashree units, and NGOs, can support this objective.

Way Forward

Tasks ahead include:

Improved storage. There is a need to further strengthen food grain storage and transportation systems to ensure they meet NFSA requirements and support timely distribution. In view of increasingly unpredictable weather patterns and the growing incidence of natural disasters, adopting scientific storage solutions has become essential. Expanding adequate storage infrastructure, including the phased and time-bound introduction of steel silos, should be prioritised to safeguard food grain quality.

Improved monitoring. End-to-end computerisation of the food supply chain, from FCI godowns to the beneficiary's doorstep, should be strengthened to ensure the delivery of the correct quantity and quality of foodgrains to FPSs and beneficiaries. Monitoring mechanisms need to be enhanced through regular

inspections at godowns and FPSs, real-time inspections using the FPS Mobile Application, mandatory quality checks at all stages based on standard operating procedures, and the expedited rollout of GIS tracking and CCTV surveillance to prevent pilferage. Greater efficiency and transparency can be achieved by leveraging advanced technologies such as Artificial Intelligence and Big Data Analytics, contributing to improved grain governance in the State. Strengthening FPS-level vigilance committees and institutionalising social audits across all FPSs will further enhance service quality and accountability.

Ensuring inclusion and access. Inclusion has been central to Kerala's approach to food security. Initiatives such as grain vending machines (Anytime Anywhere Ration Shops), mobile ration shops, and the Oppam programme should be further scaled up to ensure convenient and continuous access to food grains for the working population in urban areas, tribal communities in remote regions, and bedridden elderly beneficiaries.

Local-level interventions such as Janakeeya Hotels, which provide at least one meal a day to highly vulnerable groups including destitute and street dwellers, can be strengthened through greater involvement of LSGs and community organisations. Continued support and encouragement from the State will enable LSGs, already responsible for mid-day meals and Anganwadi nutrition, to undertake more innovative and sustainable food security initiatives at the local level.

Improving Supplyco. To further enhance its effectiveness, the Supplyco network should be expanded, with greater product variety and choices introduced to better meet consumer needs. Ensuring adequate stocking of outlets and strengthening staff training in consumer relations will be essential to improving service delivery. The initiative of conversion of FPS in to K-Store should be further strengthened through reliable stock availability and appropriate product selection at these outlets, which will be critical to the success of the initiative.

Improving nutritional and health outcomes. While Kerala has been successful in ensuring food security, there is considerable scope to improve nutritional outcomes, as adverse indicators such as anaemia, underweight, and obesity remain prevalent. Ensuring nutrition security will require providing a balanced diet with adequate calories, proteins, and micronutrients, through measures such as cereal fortification and promotion of micronutrient-rich foods like millets. Shifts in food consumption, including a declining preference for rice and increased intake of processed foods, highlight the need to promote diverse cereals and grains while encouraging healthy dietary habits. Achieving these goals will require an integrated approach involving multiple agencies including the Departments of Food and Civil Supplies, Health, and LSGs, while also addressing the dietary needs and preferences of the growing elderly population.

Scientific studies. State-specific scientific studies, beyond NFSA-mandated concurrent evaluation and social audits, must be conducted to understand the State-specific issues and design solutions.

Chapter 12
Drinking Water and Sanitation

The policy of the government of Kerala has been to restore and protect water resources, expand supply systems, and ensure safe drinking water to every household. Safe drinking water and effective wastewater disposal are essential for public health. Challenges to this objective include water contamination, climate change, groundwater depletion, and overuse. In India, a significant share of diseases and deaths are linked to poor water quality. Strengthening water management and sanitation is crucial for health, economic growth, and poverty reduction.

The 13th Five-Year Plan identified the need to draw up a plan to assure drinking water supply to the entire population, and to protect wells, and minimise distribution losses. The 14th Five-Year Plan focused on the restoration, protection, and equitable distribution of water resources, and the augmentation of usable water supplies. This was done through auditing water supply systems, certifying domestic wells, rainwater harvesting, implementing the Jal Jeevan Mission for rural piped water, and introducing phased, decentralised sewage management across the State.

Kerala has a higher water demand than the national average. In 2011 (as per Census 2011), 62 per cent of the population in Kerala used wells as their main drinking water source, while 29 per cent had access to piped water-supply. In terms of accessibility, 78 per cent households had a water source within the premises and 14 per cent households used water sources near the premises. Census 2011 data showed that 67 per cent households had toilets and 95 per cent had a toilet facility within the premises. As on August 31, 2025, 69.3 per cent of Kerala's population was covered by piped water supply, including public taps, under the Kerala Water Authority.

Access to Drinking Water in Kerala

Wells continue to serve as a primary source of water for a significant portion of the population in Kerala. Concerns regarding water quality, particularly microbiological contamination, have emerged as critical issues requiring urgent attention. Groundwater contamination can be caused by poorly designed and maintained septic tanks, along with inadequate sewage and septage management, emphasising the need for improved sanitation infrastructure and groundwater protection to ensure safe drinking water. The quality, quantity, and regularity of water supply systems depend on several parameters including sources, infrastructure, and human resources.

Kerala aims to ensure good quality drinking water for all. The Kerala Water Authority (KWA) and Kerala Rural Water Supply and Sanitation Agency (KRWSA) are the major implementing agencies in the drinking water and sanitation sector. Local Self-Governments play an important role too.

KWA currently supplies drinking water to approximately 2.5 crore people in the State through 923 water treatment plants, 42.7 lakh household connections, and 1.1 lakh public taps. Its extensive water quality network includes a State Referral Institute, 14 District labs, 71 sub-divisional labs and 1 State lab, and 86 NABL-accredited facilities meeting ISO standards. Kerala is the only State in the country with 100 per cent metered water connections. The water tariff is uniform across the State with block tariff structure (increasing rate with increasing consumption).

Water Supply Coverage

From 2016 to 2025, Kerala recorded a steady rise in water supply connections, especially in the domestic sector, which increased from 17 lakh to 43.7 lakh. Including non-domestic and industrial connections, the total is 45.7 lakh, up from 18.1 lakh in 2016. The total number of connections has more than doubled during this period, reflecting significant expansion in piped water coverage. In contrast, the number of street taps declined from 2.1 lakh in 2016 to 90,492 in 2025 indicating a shift from public taps to individual household connections and improved access to water supply infrastructure.

There has been remarkable progress in the rural and urban water supply sectors, with various Water Supply Schemes commissioned, and implemented with the assistance of State and Union Government grants and schemes, including through the State Plan, Kerala Infrastructure Investment Fund Board (KIIFB), Rebuild Kerala Initiatives (RKI), Jal Jeevan Mission (JJM), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), National Rural Drinking Water Programme (NRDWP), and NABARD.

Between 2017-18 and 2024-25, State Plan expenditure in the sector was Rs 7,492.2 crore, including both KWA and KRWSA.

During the 13th and 14th Five-Year Plans, the Kerala Water Authority achieved major milestones in

water supply and sewerage through schemes such as the Jal Jeevan Mission (JJM), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), and KIIFB projects. Under JJM, over 21 lakh new Functional Household Tap Connections have been provided since 2019, raising rural coverage to 55.3 per cent and ensuring drinking water in all rural schools and anganwadis, with priority to vulnerable areas. With support from KIIFB, 14 projects benefiting 13.5 lakh people were completed, and the Kuttanad Drinking Water Project Phase II was initiated. Under AMRUT extensive water supply and sewerage works, including new treatment plants at Aruvikkara, Peechi, and Thiruvananthapuram, were delivered. Sewerage coverage, though limited, has improved with new networks, upgraded facilities such as the 107 MLD Muttathara plant, and the adoption of robotic manhole cleaning. A new scheme for the Guruvayur Municipality with 3 MLD capacity was commissioned on September 30, 2021, with a 7 km long sewer network. Key infrastructure upgrades included modernising the Aruvikkara pumping station and renovating KWA's civil structures.

Sewerage

The Kerala Water Authority, responsible for wastewater collection and disposal, currently operates sewerage systems to a limited extent in Thiruvananthapuram and Kochi. Efforts focus on upgrading undersized lines, repairing manholes, and extending coverage to unserved areas. A dedicated sewerage vertical was formed in July 2020 to plan State-wide systems, but challenges such as funding, land acquisition, public opposition, and approval delays persist. KWA plans small-scale projects for 2–3 ward clusters using advanced technologies for effluent reuse as per National Green Tribunal (NGT) norms, alongside maintenance of existing networks. Presently, four sewage treatment plants are operational: a 107 MLD plant at Muttathara, a 5 MLD at the Medical College in Thiruvananthapuram, a 5 MLD at Elamkulam in Ernakulam, and a 3 MLD plant at Chakkumkadavu in Guruvayur. A 12 MLD plant at Kureepuzha in Kollam is nearing completion. Expansion plans include Rs 63.9 crore for sewer lines in Kochi, supported by the Rebuild Kerala Initiatives (RKI), and Rs 179.3 crore for a 27 MLD plant and network at Sarovaram, Kozhikode supported through AMRUT 2.0.

Addressing the Issues of Water Supply in Rural Areas

To strengthen rural water supply, KWA has implemented NABARD-assisted Rural Water Supply Schemes and other initiatives. Out of 19 such projects, 17 are complete. Rural piped water coverage has risen from 34 per cent in April 2020, with the Jal Jeevan Mission accelerating progress through new schemes, completion of ongoing work, and revamping of existing systems.

Addressing the Issues of Urban Water Supply Schemes

The Kerala Water Authority, the primary service provider in both urban and rural areas, implements key projects such as the Rehabilitation and Improvement of Urban Water Supply Schemes and the Asia Development Bank (ADB)-assisted Kerala Urban Water Supply Improvement Project (KUWSIP). The former targets 100 per cent water supply coverage in urban areas through new schemes in urban LSGs, and distribution system expansion. KUWSIP focuses on improving water supply in Kochi and Thiruvananthapuram by rehabilitating production and supply networks, reducing non-revenue water, and enhancing efficiency to enable 24x7 supply.

Urban drinking water projects under AMRUT and KIIFB. Major urban water supply and sewerage improvements are being implemented through AMRUT and KIIFB funding. Under AMRUT 1.0, 206 drinking water projects and 131 sewerage schemes were sanctioned in nine urban LSGs. Most of these have been completed, including major water treatment plants at Aruvikkara, Peechi, Kottappadi, and Malampuzha. AMRUT 2.0 has sanctioned 218 drinking water and sewerage projects, and several are under execution. KIIFB supports large-scale initiatives such as alternative water supply systems, expansion of existing projects, and network strengthening, with 26 of 77 approved projects completed, along with 51 pipeline replacement works.

Addressing the Issues of Water Conservation

In 2023–24, traditional knowledge and water conservation techniques were employed for the protection, augmentation, and creation of water sources, with source improvement works aimed at ensuring adequate availability during summer and drought periods, and enhancing storage capacity. These interventions significantly mitigated water stress, while the Drinking Water – Drought Mitigation scheme addressed drought relief and emergency requirements arising from natural calamities and unforeseen incidents through measures such as repairing major pipeline bursts, restoring damaged installations, supplying water to relief camps, extending pipelines to drought-affected areas, and augmenting pumping and storage capacities.

Water Quality Monitoring and Surveillance

As part of Kerala's commitment to water safety and public health, the State has strengthened its water quality monitoring systems during the 13th and 14th Five-Year Plans, with the Kerala Water Authority (KWA) playing a central role through its Quality Control Wing and an extensive network of laboratories. The State Referral Institute for Water Quality (SRI), Nettoor, established in 2009 and NABL-accredited in 2017, serves as the apex laboratory, offering advanced testing for physical, chemical, bacteriological, heavy metal, and pesticide parameters, with plans for further upgrades using high-end equipment. Complementing the State lab are 14 NABL-accredited District laboratories and 70 sub-District laboratories, strategically located for effective surveillance and public access to water testing, of which 67 have NABL accreditation. These laboratories, accredited for key parameters such as pH, turbidity, hardness, and residual chlorine, have elevated Kerala's water quality monitoring to international standards, and are slated for further enhancement including BIS certification and the establishment of material, pipe, and meter testing facilities at SRI.

Strengthening water quality testing infrastructure is essential to ensure safe drinking water in Kerala. The initiative to equip Higher Secondary schools, engineering colleges, and life science institutions with basic testing facilities accessible to the public has decentralised water quality testing and fostered greater community involvement in monitoring water quality.

To facilitate decentralised water quality monitoring, Field Test Kits (FTKs) were initially deployed through around 5,000 Kudumbashree women with the support of Local Self-Government (LSGs). However, with the increase in the number of samples to be tested, the pace of FTK-based testing declined despite repeated efforts to revive it. Consequently, water quality testing is now predominantly carried out through Kerala Water Authority's laboratories, which maintain an average of five labs per District.

Addressing the Issues of Quality of Service and Efficiency in Implementation of Water Supply Schemes

The Kerala Water Authority is focusing on improving the quality and efficiency of existing water supply schemes by ensuring reliable access to clean water and optimising operations to reduce waste. Key measures include renovating damaged civil structures, adopting innovative technologies and modern management practices to expand network coverage, cutting non-revenue water, and lowering operational costs. Efforts

Table 12.1 *Major digital initiatives of KWA, 2016 to 2025*

Initiative	Description/Key Features
e-TAPP	State-wide online portal for water/sewerage connections and consumer services; includes non-feasibility certificate issuance.
AQUALOOM	24×7 complaint redressal software for tracking and monitoring registered public complaints
Quick pay	Online bill viewing and payment facility for consumers.
Blue Brigade	Dedicated 24×7 team for urgent maintenance, valve operations, pipeline leak repairs, and emergency works.
e-Office	Paperless office system; optional paperless bills, receipts, and payments under the Green Office initiative.
Online payment for quality testing	Digital payment facility for testing water quality samples.
Ease of Doing Business (KSWIFT)	Integration of industrial and non-domestic water supply applications with the State's KSWIFT portal.
GIS asset mapping	Mapping of pipelines and assets (2,000 km data collected) for improved asset management.
Palm-held billing machines	Digital devices for field billing, nearing full rollout.

also target production and transmission, optimisation to prevent leakage, conserving energy, and maintaining uninterrupted supply. Human resource development, research, and quality control are prioritised. Additionally, special water supply schemes ensure continuous service to institutions including medical colleges, hospitals, schools, government offices, and correction homes.

Jal Jeevan Mission (JJM)

JJM aims to provide Functional Household Tap Connections (FHTC) to all rural households, ensuring safe and adequate drinking water on a long-term basis. In Kerala, the share of Union and State Governments is 50:50. Out of the 50 per cent State share, 15 per cent is to be borne by the Panchayat and 10 per cent is beneficiary contribution. The Mission has ensured safe drinking water in all rural schools and anganwadis, introduced geo-tagging and metering, set up an online service platform with grievance redressal, and trained 5,000 Kudumbashree women in water quality testing.

Under JJM, the coverage of household water connections in Kerala has risen sharply, with Kollam crossing 70 per cent, several Districts above 50–60 per cent, and 115 Panchayats achieving 100 per cent coverage. From 2019-20, 21,08,975 FHTCs have been provided, as of August 2025, a coverage of 55.3 per cent. The expenditure on this programme between 2019 and 2025 has been Rs 11,632.3 crore, including State and Union shares.

KIIFB Projects

The Government of Kerala, through the Kerala Infrastructure Investment Fund Board (KIIFB), has significantly expanded water infrastructure under the 13th and 14th Five-Year Plans. The Kerala Water Authority (KWA) sanctioned 77 projects with a total outlay of Rs 5,399.6 crore, of which, 66 water supply projects and transmission replacements in 11 circles consisting 26 projects, have been completed with a total worth of Rs 894.5 crore. This added 228.5 MLD to the system and benefited 30.7 lakh people. Under pipeline replacement, 51 of 121 sub-projects and 48 major transmission works have been completed, improving distribution efficiency. Notable initiatives include the completion of 14 projects worth Rs 335.7 crore in the 13th Plan and the ongoing Rs 289.5 crore Kuttanad Drinking Water Project Phase II, marking a major step toward inclusive and climate-resilient water supply.

Major Projects Completed and Commissioned by the KWA in the Last Ten Years

A series of major drinking water and sewerage projects have been implemented across Kerala to address scarcity, improve quality, and expand coverage. Key initiatives include comprehensive drinking water supply projects for multiple Panchayats such as Muthuthala-Parathur-Thiruvegapura, Kozhinjampara-Vadakarapathi-Eruthempathi, Vithura-Tholikode, Athiyannur-Kottukal, and Nedumpram-Niranam-Kadapra, as well as AMRUT-supported projects such as the Guruvayur Municipality scheme, Peechi 20 MLD Water Treatment Plant, and Peechi Dam Floating Intake System. Urban infrastructure has been strengthened through the Aruvikkara 75 MLD Water Treatment Plant, Medical College 5 MLD Sewage Treatment Plant, and Guruvayur Sewerage Project, while rural areas benefit from targeted schemes such as Mannurkara-Veerenkavu-Perumkulam, Perunad-Athikayam, and Kalluvathukkal-Parippally-Velinalloor. Together, these projects deliver safe and reliable water supply to lakhs of residents and addressing long-standing water and sanitation challenges across Districts.

Kerala Rural Water Supply and Sanitation Agency (KRWSA) or Jalanidhi scheme

The Kerala Rural Water Supply and Sanitation Agency (KRWSA), through the World Bank–assisted Jalanidhi programme (2000–2019), successfully implemented 5,884 community-managed rural water supply schemes across 227 Gram Panchayats, directly benefiting over 4.5 lakh people. In addition to expanding access to safe water, the programme facilitated the construction of more than 40,000 rainwater harvesting structures, 40,164 sanitation units, and 574 groundwater recharge systems, alongside robust water quality monitoring measures. Innovative interventions included the introduction of solar-powered pumping in tribal regions, promotion of greywater reuse, and the establishment of 848 Jalasree Clubs in schools to strengthen water literacy and conservation practices. The decentralised, demand-driven approach has been particularly effective in addressing the needs of Scheduled Caste, Scheduled Tribe, and Below Poverty Line households, contributing to Kerala's broader goals of equitable and sustainable water resource management.

Interventions of Jalanidhi in grey water management. Grey water is waste water generated from domestic use, excluding toilets. Kerala, while achieving notable progress in drinking water access, continues to face significant challenges in wastewater collection, treatment, and disposal, prompting a strategic focus on grey water management to mitigate environmental risks, promote reuse, and reduce freshwater demand. Under KRWSA, pilot and institutional projects have

been launched, including the commissioning of 65 water quality mitigation units, implementation of two grey water management systems in tribal hostels, and completion of a community-level system in Marayoor Grama Panchayat. A notable intervention in Marayoor's Babu Nagar colony replaced a costly central sewage system with decentralised Magic Pit technology for 60 households, ensuring low-cost, locally acceptable, and community-owned sanitation. This initiative, supported by LSG engagement and awareness programmes, has effectively resolved grey water issues in the area and is now sought for replication in other vulnerable regions, highlighting the potential of decentralised, community-driven solutions within Kerala's broader water management framework.

The Rajiv Gandhi Memorial Residential Higher Secondary School hostel in Noolpuzha Gram Panchayat, Wayanad, was discharging approximately 20,000 litres of wastewater daily from bathrooms, kitchens, and its canteen into nearby canals, leading to water pollution, increased waterborne diseases, and community protests. In response, KRWSA installed a Decentralised Wastewater Treatment System (DEWATS) with a capacity of 15 cubic metres per day, comprising a settler tank, anaerobic baffled reactor, anaerobic filter, horizontal plant gravel filter, and a pumping system for reusing treated water in campus gardens and vegetable plots. This intervention has effectively eliminated untreated wastewater discharge, improved local water quality, and established a closed-loop water recycling system, while promoting community awareness and participation in sustainable sanitation practices, offering a replicable model for similar water-stressed and vulnerable areas.

Rain Water Harvesting

Rainwater Harvesting (RWH) has emerged as a critical intervention to address water scarcity in Kerala's hilly, coastal, and water-stressed regions, with KRWSA acting as the State's nodal agency for implementation. Since establishing the Rain Centre in 2004 to promote RWH and groundwater recharge, KRWSA has completed 12,186 RWH structures of 10,000-litre capacity each and 2,936 open well recharge systems, alongside initiatives that have recharged 8,090 wells, constructed 15,931 new wells, and implemented household-level recharge systems in 11,446 homes. Current programmes aim to recharge an additional 3,464 wells and improve 383 household wells with parapets, platforms, and RWH-based systems, ensuring excess rainwater is effectively used to enhance groundwater levels. These efforts, integrated with KRWSA's role in implementing the Jal Jeevan Mission, demonstrate a scalable, sustainable model for transforming harvested rainwater into safe, potable water while strengthening community water security.

Way Forward

Future policy in Kerala will continue to combine supply-side augmentation, new water storage water storage structures and reservoirs, and integrated management, with demand-side efficiency. Planning in Kerala's drinking water and sanitation sectors will continue to integrate sustainable, tech-innovative, and participatory practices.

Chapter 13
Agriculture and Allied Activities

Agriculture in Kerala: Significant Gains and Outstanding Challenges in Development

It can be said that no sector in the Kerala economy has been subject to external and domestic stresses over the last decade as agriculture was. Yet, the story of agriculture in Kerala is one of resilience and revival. The agricultural value added in Kerala rose remarkably, particularly over the past five years, to wipe out the losses of the last decade. The processing sector now attracts significantly higher levels of private investment than in the past. Policies and plans that drove this revival have also created a platform for potential growth in the next decade founded on the three pillars of productivity growth, aggregation and marketing, and investments in value addition.

Agriculture in Kerala, a long narrow strip of land between the Arabian Sea in the West and the Western Ghats in the east, retains its own richness and specificities. Cultivation is organised in three natural physiographic divisions: the Highlands, the Midlands, and the Lowlands. These regional features influence the availability of rainfall and the region's topography, which in turn have structured the evolution of soil complexes, cropping patterns, and other possibilities of crop development. Cultivation takes place in large plantations, wetlands, garden lands, and homesteads across the length and breadth of the State.

Constraints to Growth

Kerala Development Report 2021 had presented a detailed discussion on the major constraints on agricultural development in the State. Most constraints have historically evolved and are part of the State's unique developmental achievements, while some of them are a drag on agricultural growth, others provide windows of opportunity in the future. These constraints may be classified into three types, structural, technical, and socioeconomic.

Structural constraints

Among the structural constraints, the first relates to land use and the constant stress on land to be diverted for non-agricultural uses. In 2024-25, the net sown area in the State was 19.7 lakh ha, which was only about 51 per cent of the total geographical area in the State. Further use of land for agriculture was limited by large extent of forests, 10.8 lakh ha accounting for 28 per cent of the geographical area in 2024-25. Another 6.2 lakh ha, accounting for 16 per cent of the geographical area, was devoted to non-agricultural purposes.

Secondly, out of the 75.8 lakh operational holdings in the State in 2015-16, 73.3 lakh operational holdings (about 97 per cent) were of sizes less than one hectare. About 61 per cent of the area under these operational holdings also belonged to the land size-class of less than one hectare. Consequently, the average size of an operational holding was just 0.18 ha, which posed significant challenges to the attainment of scale in production and post-production activities.

Thirdly, given the relatively low economic importance of agriculture, landowners perceive of land less as a productive resource and more as a speculative asset. Leaving land fallow and reclaiming wetlands for non-agricultural purposes are common. Those who own land have poor interest in farming, leading to a strong disincentive against investing in agriculture.

Fourthly, growth prospects in Kerala's agriculture are closely linked to the export performance of commercial crops. Five commercial crops - tea, coffee, rubber, pepper and cardamom occupy - about 7.8 lakh ha of area, or about 40 per cent of the net sown area. Their prices are significantly integrated with global agricultural prices, which are outside the policy reach of the State Government. The free trade policies of the Government of India after 1994 have been instrumental in frequently depressing the prices of these commodities, creating pockets of distress among farmers.

Technical constraints

Among the technical constraints, the first relates to land use planning. Kerala's agricultural space is characterised by the existence of a series of micro-environments suited to specific, yet diverse, kinds of agricultural activities. However, the primary focus of research, development and developmental activities in agriculture is crop-oriented rather than resource or farm-oriented. While the State has been divided into 23 agro-ecological zones, no appropriate cropping patterns for these zones have been identified and propagated. Cropping patterns continue to be determined by the traditional experiences of farmers.

Secondly, wide yield gaps persist in the State's agriculture. As the discussion in this chapter will demonstrate, the highest attainable/attained yields in a range of crops are either double or triple the existing

average yields. These yield gaps are, broadly, due to the absence of scientific agronomic practices, particularly in the spheres of varietal adoption, soil management, integrated nutrient management, integrated pest management and irrigation.

Thirdly, while Kerala is at the receiving end of extreme climate events and climate variabilities, its agriculture is not sufficiently resilient to climate shocks. Lower levels of rainfall, unseasonal rain, heat waves, and changes in atmospheric moisture influence the production performance of crops in fundamental ways. Investments in building adaptation against such shocks continue to be low, which has introduced multiple vulnerabilities in the practice of agriculture.

Socio-economic constraints

Among the socioeconomic constraints, the first relates to the composition of the agricultural population. According to a survey of the Department of Economics and Statistics, only 19.5 lakh households of the 46.2 lakh rural households in Kerala (42.2 per cent) were "agricultural households" in 2024-25. Of these 19.5 lakh agricultural households, only 28.3 per cent had self-employment in crop production as the major source of income. About 23.7 per cent had regular wage or salaried work in non-agricultural sectors as their major source of income. Thus, most farmers in Kerala are "part-time" farmers and not "full-time" farmers. Consequently, there are strong disincentives related to the quantum of investment, extent of time, the amount of effort and the intensity of care given in farms– all of which are critical for the adoption of scientific agronomic practices.

Secondly, given that a large share of rural workers worked in the non-agricultural sectors and obtained higher wages than agricultural labourers, wages in agriculture are considerably higher in Kerala than in other States. While this feature is a salutary achievement regarding the conditions of work of agricultural labourers, it does impose an additional burden on the economics of cultivation. Due to the higher wages, most farmers do not adequately absorb labour in farms, which in turn adversely affects scientific management of farm tasks.

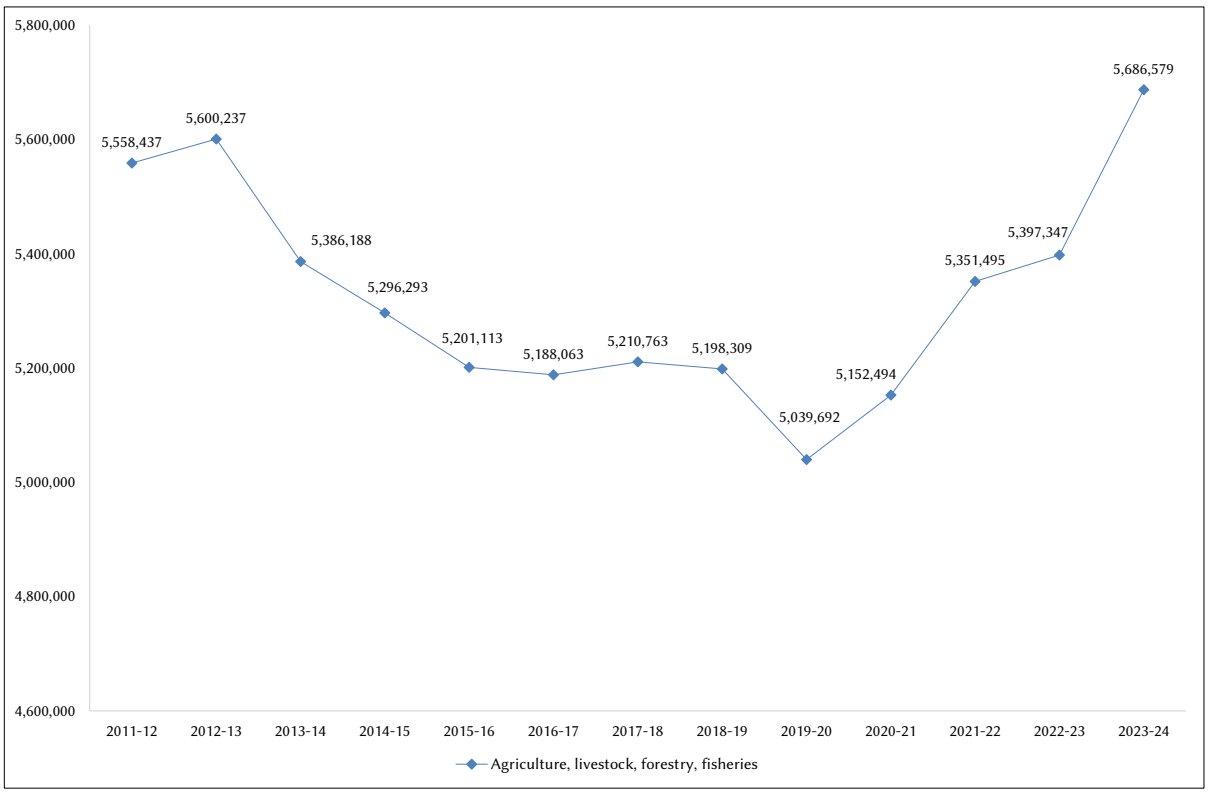


Figure 13.1 *Trends in the value of output in agriculture, livestock, forestry and fishing, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24* in Rs lakh
Source: Central Statistics Office
Note: The Y-axis is not pivoted to zero for illustrative purposes.

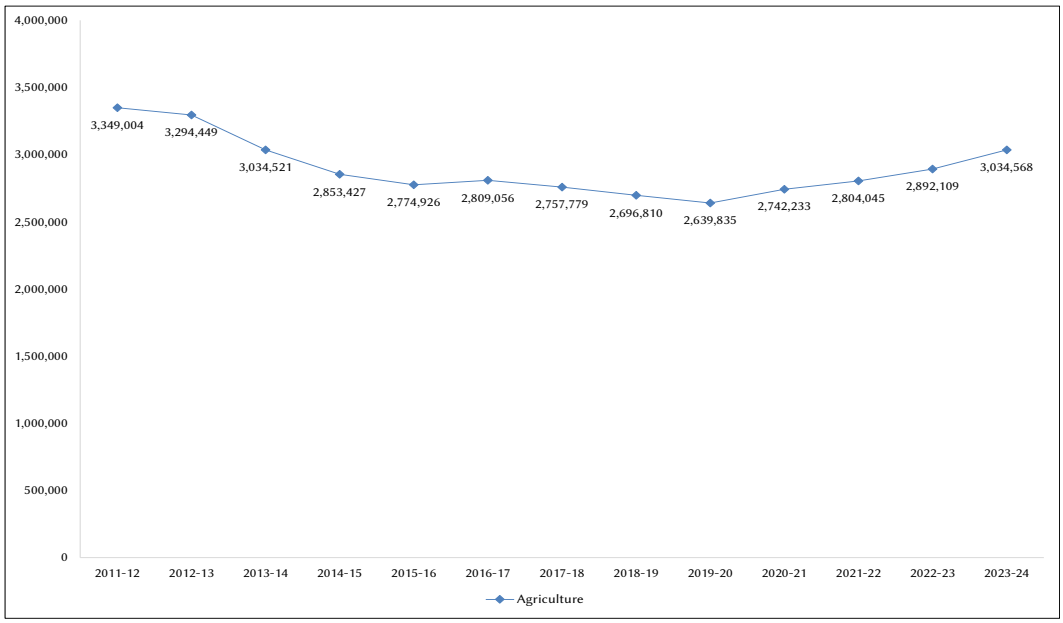


Figure 13.2 *Trends in the value of output in agriculture, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24* in Rs lakh
Source: Central Statistics Office

Thirdly, higher wages in agriculture must typically nudge farmers towards an intensive use of labour-saving machinery. However, the reluctance to invest in farms has constrained the adoption of machinery, which is complicated by the absence of appropriate machinery suited to the use in small and marginal farms or in plantation crops as well as their use by female labourers. The total availability of farm power in Kerala in 2018-19 was estimated at only 1.3 kW per ha, which compares poorly with the national average of 2.5 kW per ha or the figure for Punjab and Haryana at 6 kW per ha and 5.5

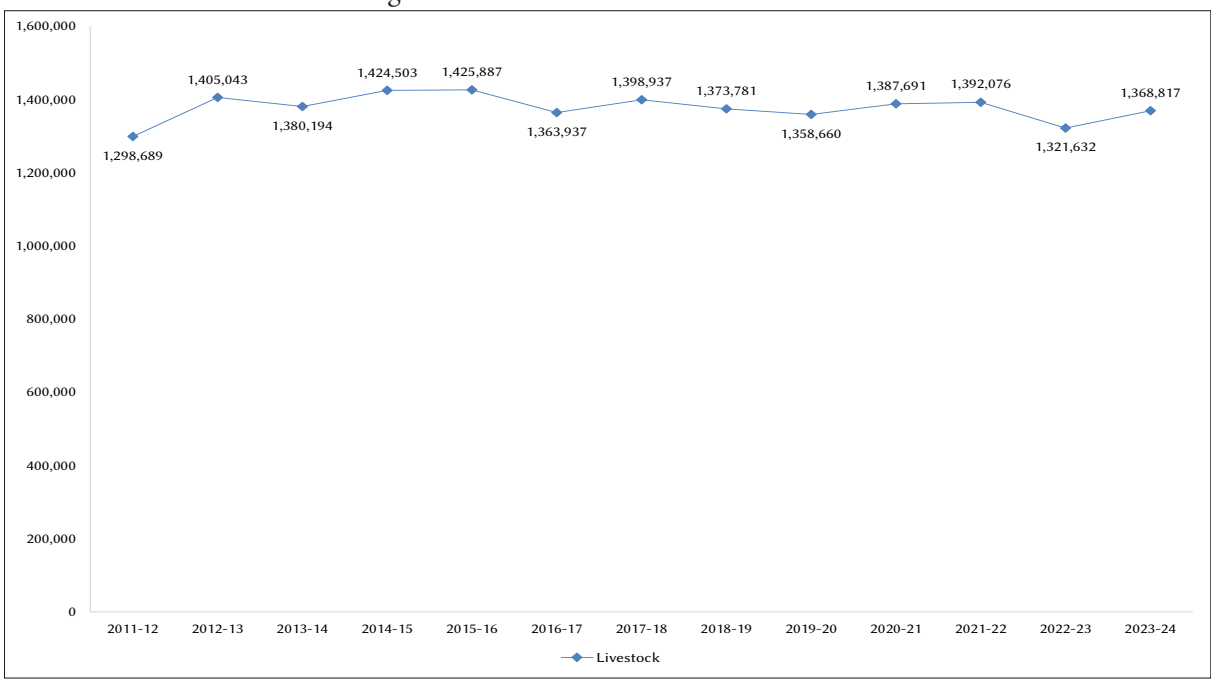


Figure 13.3 *Trends in the value of output in livestock, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24* in Rs lakh
Source: Central Statistics Office

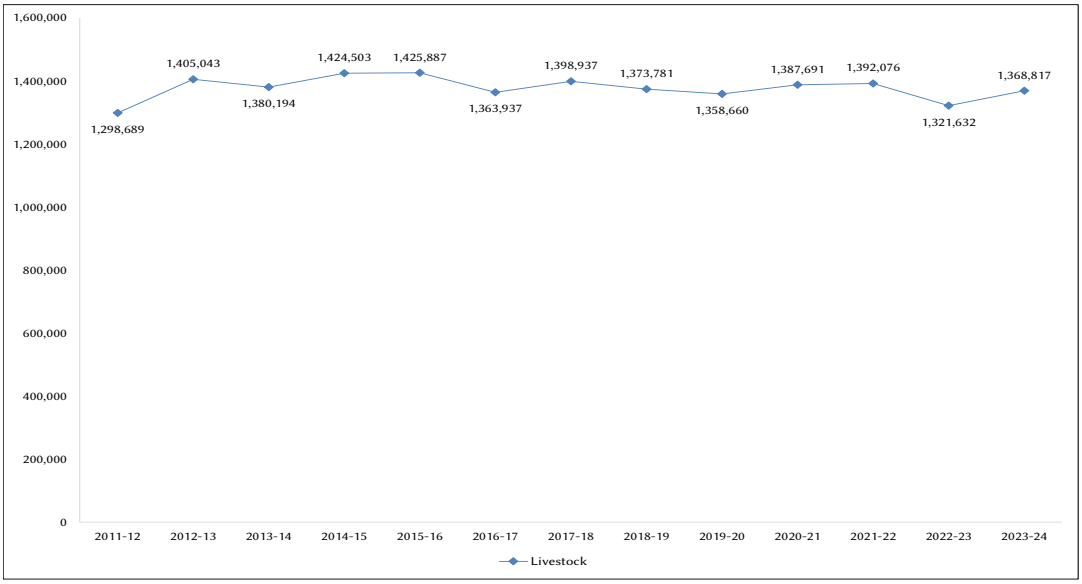


Figure 13.4 *Trends in the value of output in fisheries, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24* in Rs lakh
Source: Central Statistics Office

kW per ha respectively. For instance, Kerala had only four tractors per 1000 ha area, while the corresponding figures were 96 in Haryana, 79 in Punjab, 46 in Tamil Nadu and 32 in Karnataka.

Trends in Agricultural Growth

The aggregate trends

A disquieting feature of agricultural growth in Kerala was a long period of stagnation, if not decline, in the second decade of the 21st century. This has been explained in Kerala Development Report 2021. According to the data at constant 2011-12 prices, there was an absolute fall in the Value of Output (VoO) in agriculture and the allied sectors from 2011-12 onwards till 2019-20. Total VoO from agriculture, animal husbandry, fisheries, and forestry shows decline from Rs 55,584 crore in 2011-12 to Rs 50,397 crore in 2019-20 (Figure 13.1). This absolute fall, to the tune of Rs 5,187 crore, generated adverse ripples across the agrarian economy, including a severe compression of farmer's incomes.

Within agriculture and the allied sectors, the fall of VoO was concentrated in the crop sector. In the crop sector, the fall was drastic from Rs 33,490 crore in 2011-12 to Rs 26,398 crore in 2019-20 (Figure 13.2). The VoO in the livestock sector remained largely stagnant through this period, while the VoO in the fisheries sector was continuously growing (Figures 13.3 and 13.4).

However, there was the clear beginning of a growth revival after 2019-20, with the VoO in the agriculture and allied sectors rising from Rs 50,397 crore in 2019-20 to Rs 56,866 crore in 2023-24. The VoO in 2023-24 was higher than the VoO in 2011-12, marking the end to a period of crisis in the agrarian economy. While an overall stagnation continued in the livestock sector, reasonable growth continued to be recorded in the fisheries sector, and there were visible signs of a revival in the crop sector after 2019-20. The VoO in the crop sector grew from Rs 26,398 crore in 2019-20 to Rs 30,346 crore in 2023-24.

By 2026-27, it is expected that the growth revival in agriculture will be more complete with the crop sector continuing to register a good performance. This would still imply the loss of growth momentum for over about a decade but also could be considered as a platform for a renewed phase of rejuvenation and growth.

Disaggregated trends

The trends in the revival of growth after 2019-20 were not uniform across crops. Figure 13.5 provides crop-wise trends in VoO in Kerala from 2011-12. There were a set of crops where the absolute VoO in 2023-24 continued to be lower than in 2011-12, which include paddy, pulses, rubber, coconut, tea and arecanut. In paddy, the VoO fell between 2011-12 and 2016-17, further rose till 2020-21, and then fell again. In pulses, the VoO continuously fell from 2011-12 to 2023-24. The only pulse that appears to have survived is cowpea. In coconut, there was a continuous fall in the VoO from

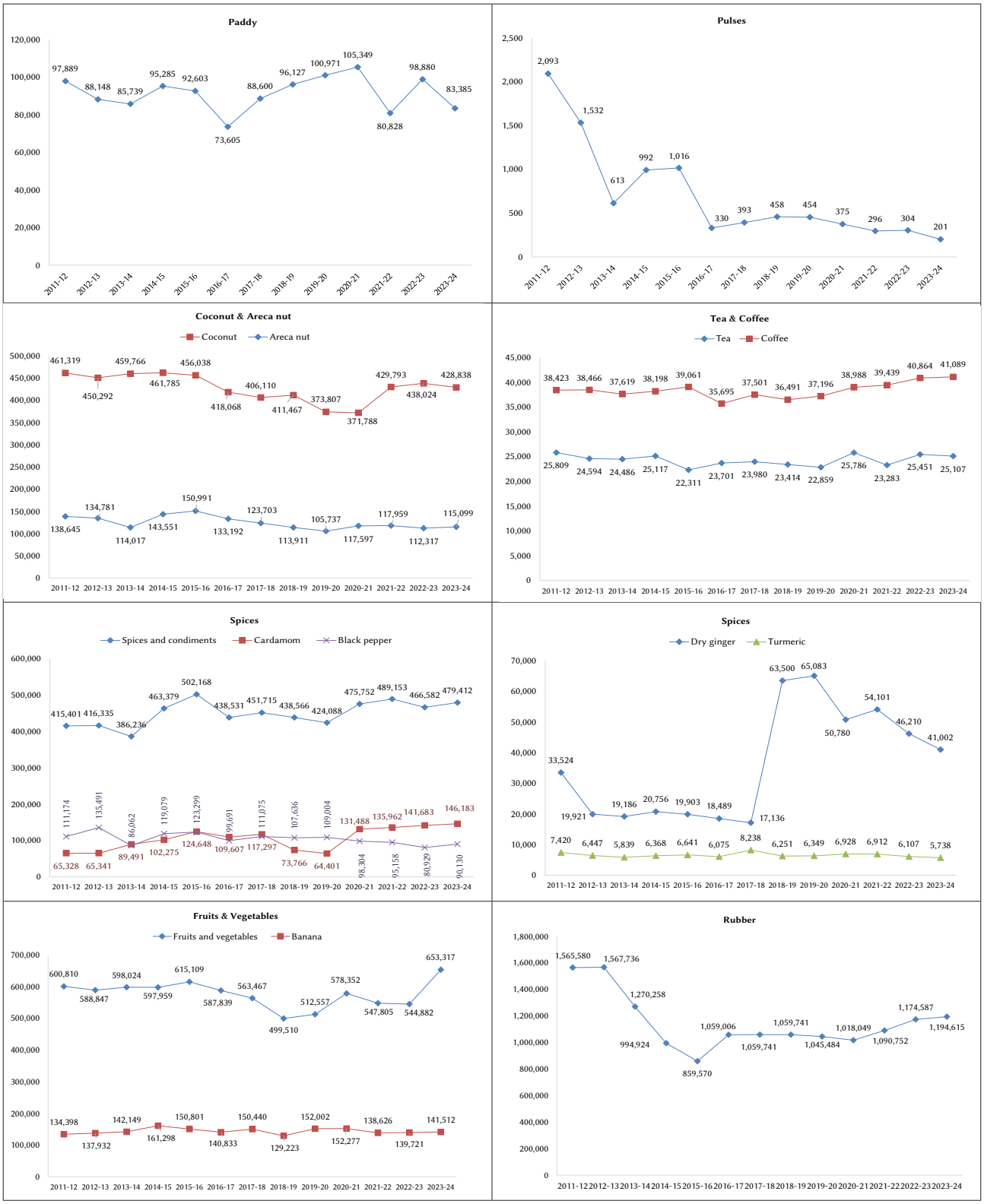


Figure 13.5 *Trends in the value of output (VoO) in selected crops, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24* in Rs lakh
Source: Central Statistics Office.

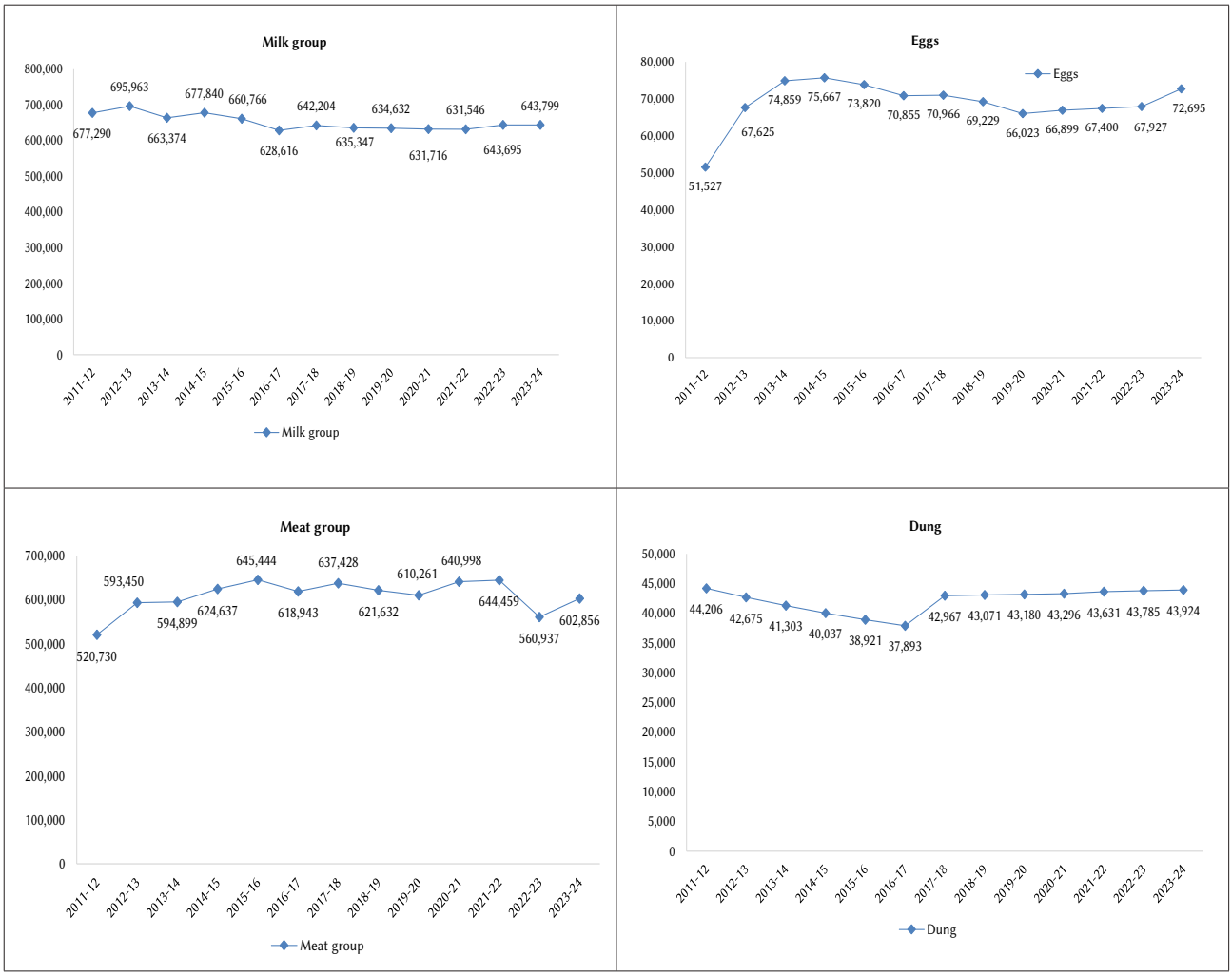


Figure 13.6 *Trends in the value of output in selected livestock sectors, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24* in Rs lakh
Source: Central Statistics Office

2011-12 till 2020-21, and then a revival afterwards. In rubber, the VoO fell from 2011-12 till 2015-16, and then began to rise after a short period of stagnation up to 2023-24. In the case of tea, the VoO stagnated across the period between 2011-12 and 2023-24. Arecanut was another crop that showed a declining trend in VoO.

The trends in the VoO of the above crops — one of a decline, or a decline combined with a weak revival — were different from the trends in the VoO of a set of other crops. In those crops, there was continuing growth or a distinct and strong revival of growth over the past decade. In spices and condiments, there was a slow but gradual rise in the VoO between 2013-14 and 2023-24. In other words, spices and condiments were a clear outlier to the overall trends in the VoO. At the same time, not all spices and condiments showed similar trends. The VoO of cardamom and nutmeg grew, but the VoO of pepper and turmeric fell. There was also growth in the VoO of the category "other spices and condiments", which indicated the expansion in the cultivation of several new spice crops, such as vanilla, star anise, cinnamon, cumin and fenugreek.

The VoO of coffee fell between 2011-12 and 2016-17 but continuously grew afterwards till 2023-24. Another crop group that showed a distinct revival was fruits and vegetables. While the VoO in fruits and vegetables fell till 2018-19, there was a sharp revival afterwards. In the case of banana, the overall trend in VoO was of a slow growth, leaving the levels in 2023-24 only marginally higher than the levels in 2011-12. The trends in the VoO in floriculture were largely stagnant.

In summary, while the crop sector in Kerala shows a clear sign of overall revival in the recent years, the patterns of the revival were mixed across crops and crop groups. Kerala Development Report 2021 underlined the possibilities of such a trend, where it was noted: "as part of the conscious policy interventions under the 13th Plan, the downward slide in agriculture could be halted". The revival was delayed till around 2019-20 only due to the successive endogenous shocks to the agrarian economy, such as the demonetisation of 2016, the floods of 2018, and the extreme monsoon of 2019. The period of revival was also the period of implementation of a focussed programme for agricultural development titled Subhiksha Keralam.

Within the livestock sector, the major components are milk, eggs and meat (Figure 13.6). Information shows a reduction of import dependence in milk in Kerala, including the extent of milk imports by MILMA. Yet, the VoO in milk showed a marginal fall from Rs 6,772 crore in 2011-12 to Rs 6,286 crore in 2016-17, followed by a weak revival to Rs 6,438 crore in 2023-24. It is possible that the large extent of milk produced and sold locally and informally across the State by small producers goes undetected in the aggregate data. This issue needs to be examined more carefully. In eggs, the VoO rose from Rs 515 crore in 2011-12 to Rs 727 crore in 2023-24, but there was an extended period of stagnation between 2014-15 to 2019-20. The performance in the egg sector would have been far more credible if not for this interregnum. The VoO in the meat sector continued to show a slow and regular increase from Rs 5,207 crore in 2011-12 to Rs 6,029 crore in 2023-24. Here too, there were short periods of fall in the VoO leading to a sub-optimal performance in the long run.

Within the fisheries sector, the VoO in marine fisheries sector continued to maintain its dominant status vis-à-vis the inland aquaculture sector. This pattern was dissimilar to the fisheries sector at the national level, where the inland aquaculture sector is more dominant than the marine fisheries sector. Further, the growth in VoO after 2011-12 was faster in marine fisheries than in inland aquaculture in Kerala– despite an absolute fall in the VoO in the two years of 2019-20 and 2020-21 (Figure 13.7). While the strong performance of marine fisheries underlines Kerala's

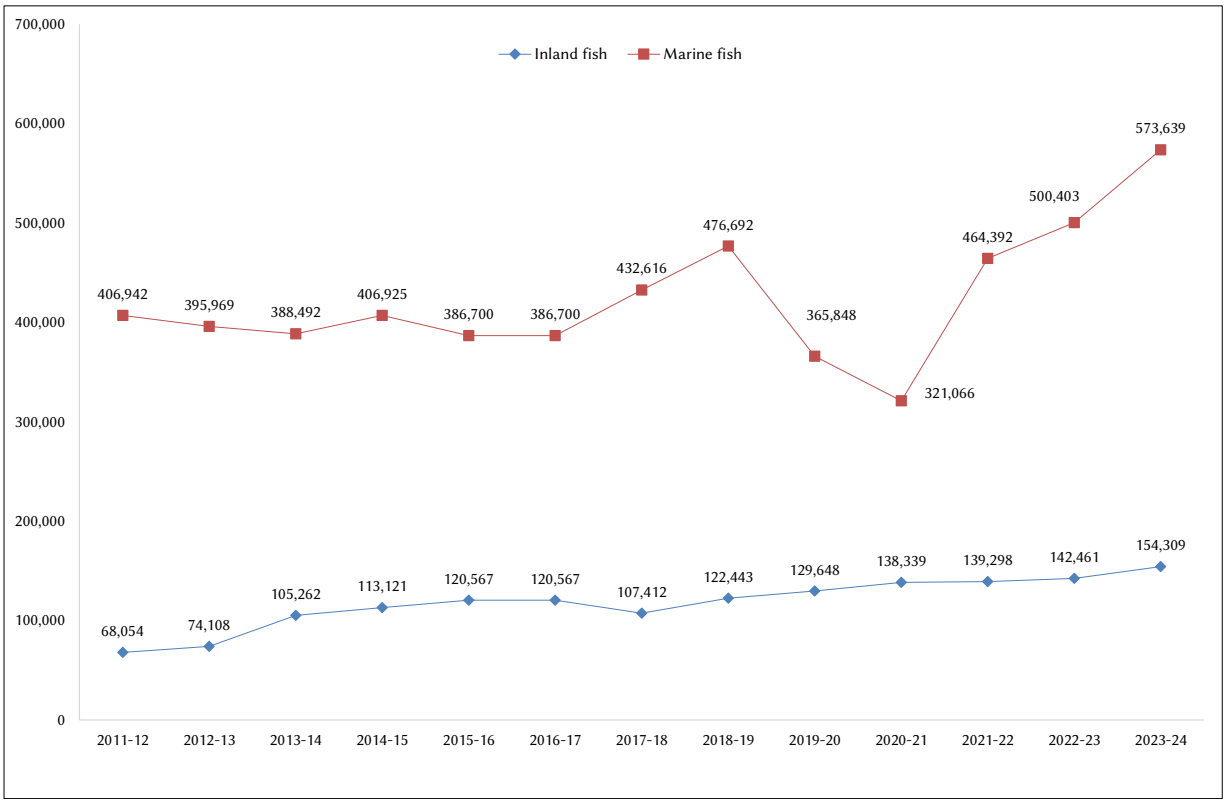


Figure 13.7 *Trends in the value of output in marine and inland fisheries, at constant prices, 2011-12 base year, Kerala, 2011-12 to 2023-24,* in Rs lakh
Source: Central Statistics Office

Table 13.1 *Share of each sub-sector in the value of output in agriculture and allied sectors, Kerala, 2011-12 to 2023-24* in per cent

Year	Crops	Livestock	Forestry and logging	Fishing and aquaculture	Total VoO
2011-12	60.0	23.3	8.9	7.8	100.0
2012-13	58.5	25.1	8.8	7.7	100.0
2013-14	56.6	26.9	7.9	8.7	100.0
2014-15	53.8	27.8	9.0	9.4	100.0
2015-16	52.2	29.1	9.5	9.1	100.0
2016-17	53.5	27.1	10.1	9.3	100.0
2017-18	53.2	27.0	9.6	10.2	100.0
2018-19	51.8	26.9	10.2	11.1	100.0
2019-20	52.3	27.2	11.1	9.5	100.0
2020-21	53.0	27.3	11.1	8.7	100.0
2021-22	52.3	26.1	10.4	11.1	100.0
2022-23	54.2	24.4	10.2	11.3	100.0
2023-24	53.6	25.6	10.0	10.7	100.0

Source: Computed from CSO reports

long-term strengths and advantages, the relatively poor performance of inland aquaculture showcases a strong area of potential growth in the future.

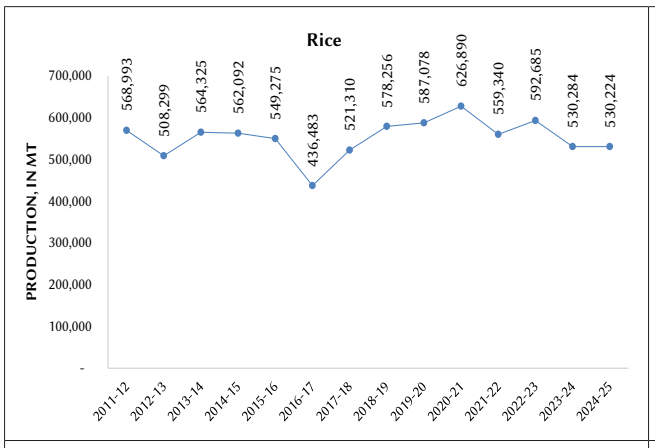
The period of revival of VoO in agriculture and allied sectors after 2019-20 also witnessed changes in the contribution of each sub-sector (see Table 13.1). From 2011-12 to 2023-24, the contribution of the crop sector fell from 60 per cent to 53.6 per cent. While the contribution of livestock sector increased only marginally, the contribution of forestry and fisheries sectors increased by a greater margin over this period. But during the period of revival between 2019-20 and 2023-24, the contribution of the crop sector picked up again, the contribution of the livestock sector fell, and the contribution of forestry and fisheries sectors increased by a lesser margin. To put it differently, consider the incremental addition to the VoO between 2019-20 and 2023-24, about 61 per cent of the increase came from the crop sector, while about 36 per cent of the increase came from the fisheries sector.

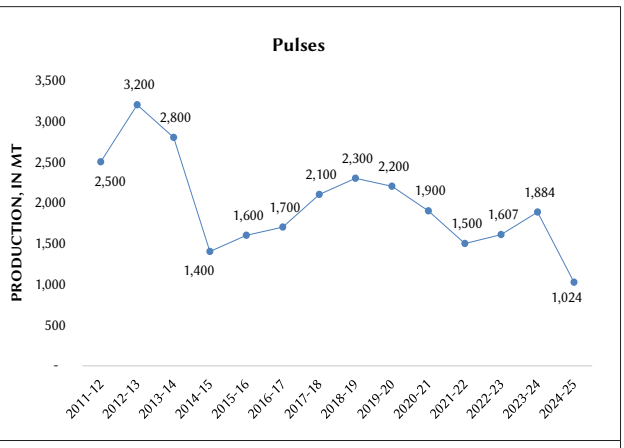
Crop-wise trends in production

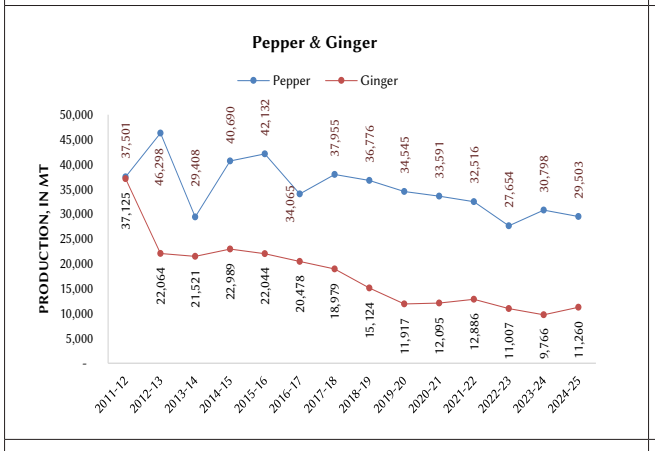
In this section, data on the production of crop from the State's Department of Economics and Statistics and commodity boards have been used. This aims at delineating the specific areas of strong performance in the recent years and to identify continuing weaknesses and challenges for improved policy interventions in the future. It is also important to learn from the areas of strong performance to incorporate best practices in the design of future interventions.

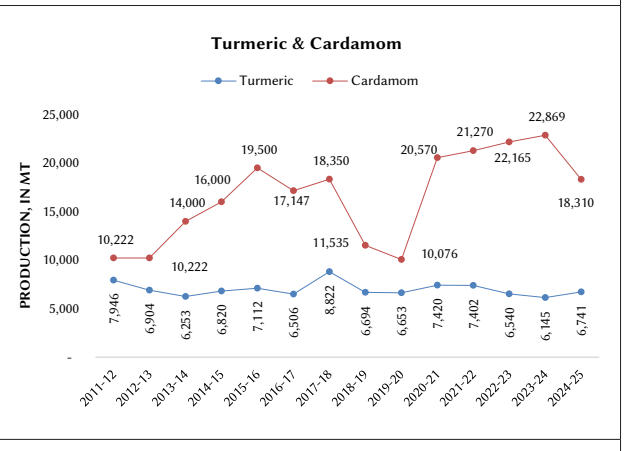
The trends in the production of major crops and crop groups are provided in Figure 13.8. In case of food grains, production of rice fell between 2011-12 and 2016-17, but increased substantially from 4.4 lakh MT in 2016-17 to 6.3 lakh MT in 2020-21. There was a fall of rice production to 5.3 lakh MT by 2024-25, but this was still higher than the production in 2016-17.

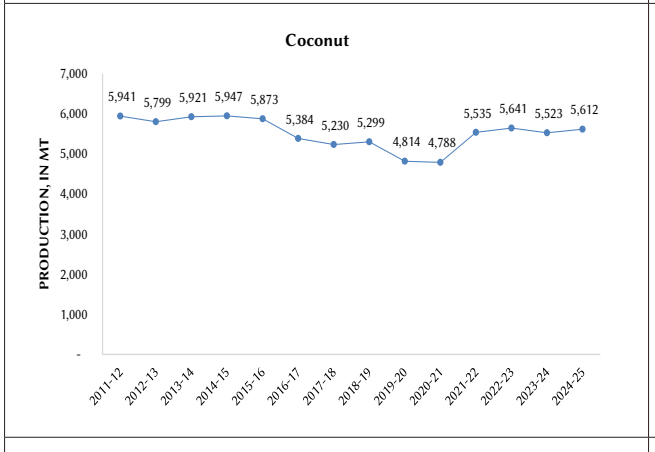
The creditable performance in rice production was owing to targeted interventions through the State Plan. There was a significant rise in the Plan allocation for rice development over this period. The total plan allocation for rice development rose from Rs 69.5 crore in 2016-17 to Rs 150 crore in 2025-26. This excludes other allocations for infrastructure development in the paddy sector by public organisations like the Kerala Land Development Corporation (KLDC). These allocations through the Department as well as Local

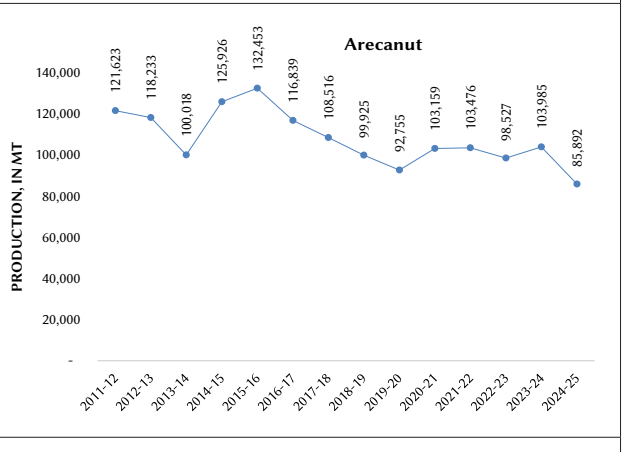

Rice
PRODUCTION, IN MT
568,993
508,299
564,325
562,092
549,275
436,483
521,310
578,256
587,078
626,890
559,340
592,685
530,284
530,224

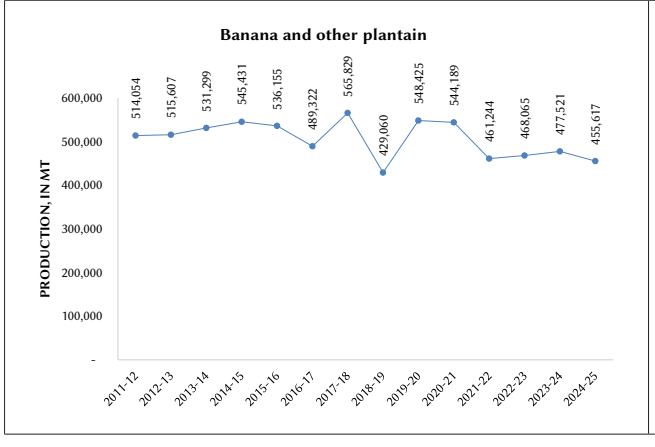

Pulses
PRODUCTION, IN MT
2,500
3,200
2,800
1,400
1,600
1,700
2,100
2,300
2,200
1,900
1,500
1,607
1,884
1,024

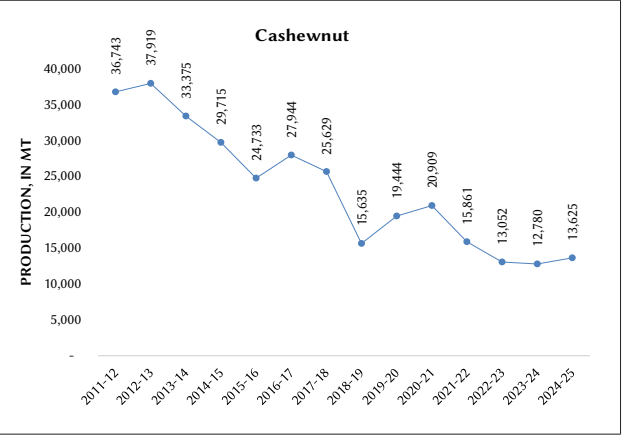

Pepper & Ginger
Pepper
Ginger
PRODUCTION, IN MT
37,501
46,298
29,408
40,690
42,132
34,065
37,955
36,776
34,545
33,591
32,516
27,654
30,798
29,503
37,125
22,064
21,521
22,989
22,044
20,478
18,979
15,124
11,917
12,095
12,886
11,007
9,766
11,260


Turmeric & Cardamom
Turmeric
Cardamom
PRODUCTION, IN MT
10,222
14,000
16,000
19,500
17,147
18,350
11,535
10,076
20,570
21,270
22,165
22,869
18,310
10,222
7,946
6,904
6,253
6,820
7,112
6,506
8,822
6,694
6,653
7,420
7,402
6,540
6,145
6,741


Coconut
PRODUCTION, IN MT
5,941
5,799
5,921
5,947
5,873
5,384
5,230
5,299
4,814
4,788
5,535
5,641
5,523
5,612


Arecanut
PRODUCTION, IN MT
121,623
118,233
100,018
125,926
132,453
116,839
108,516
99,925
92,755
103,159
103,476
98,527
103,985
85,892


Banana and other plantain
PRODUCTION, IN MT
514,054
515,607
531,299
545,431
536,155
489,322
565,829
429,060
548,425
544,189
461,244
468,065
477,521
455,617


Cashewnut
PRODUCTION, IN MT
36,743
37,919
33,375
29,715
24,733
27,944
25,629
15,635
19,444
20,909
15,861
13,052
12,780
13,625

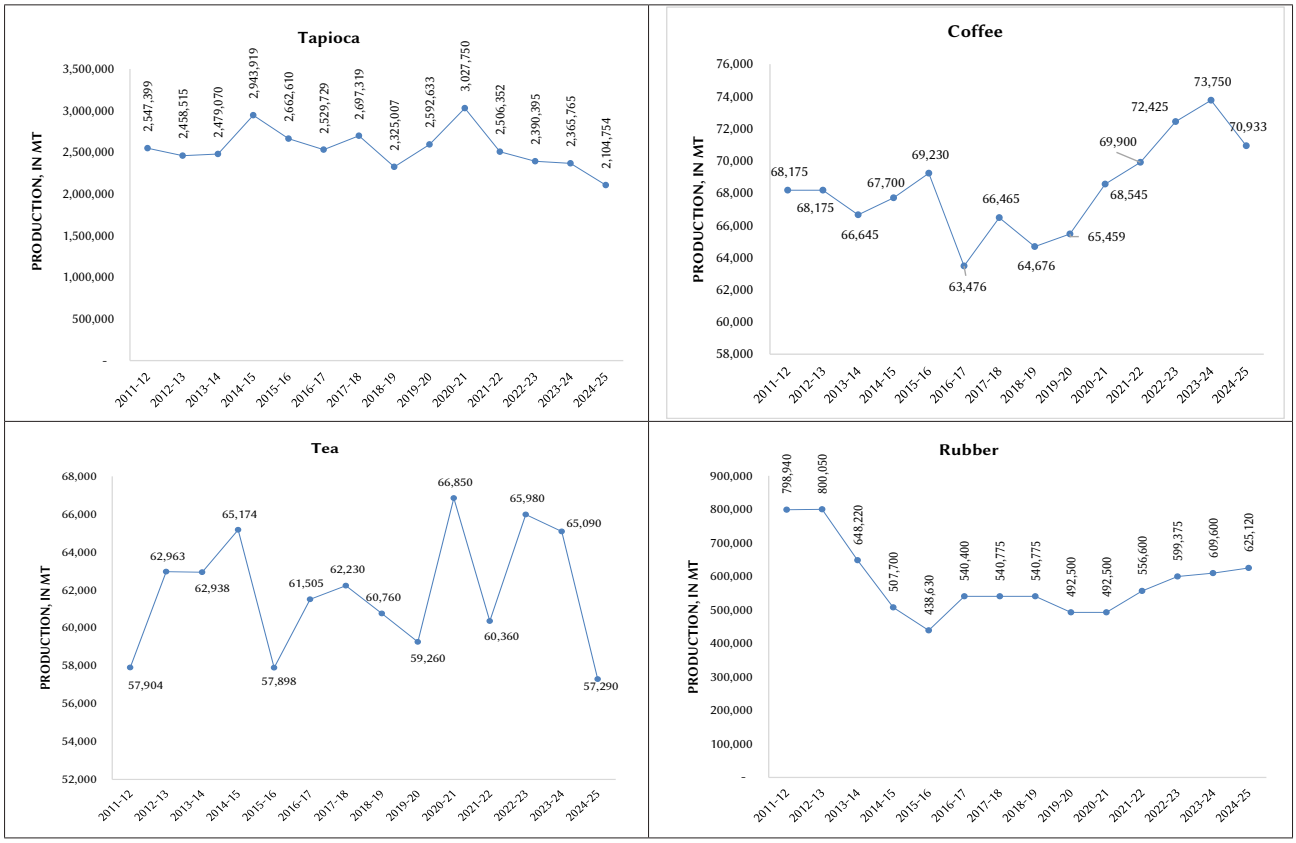


Figure 13.8 *Trends in the production of selected major crops, Kerala, 2011-12 to 2024-25* in MT and million nuts
Source: Department of Economics and Statistics, GoK, Rubber Board, Coffe Board, Coconut Development Board, and Spices Board

Self-Governments (LSGs) facilitated the reclamation of fallow land, the subsidised purchase of inputs like seeds, fertilisers and pesticides, and public procurement of paddy at one of the highest minimum support prices (MSP) in the country. In 2024-25, the procurement price for paddy in Kerala was Rs 28.2 per kg, which was significantly higher than the national MSP of Rs 23 per kg. The State Government added an incentive bonus of Rs 5.2 per kg to the national MSP.

The provision of a higher MSP was only a part of the assistance given to paddy farmers. Equally, or more significant, was the provision of various subsidies by the LSGs for paddy cultivation. Every season, a production bonus of Rs 1,000 per ha was provided. In addition, there was an assistance to support the payment of wages, and the costs of seeds, lime, organic manures, fertilisers, biocontrol agents and other essential inputs and operations up to Rs 25,000 per ha. Still further, there were special assistance given for the initiation of paddy cultivation in erstwhile fallow land up to Rs 40,000 per ha. Between 2016-17 and 2024-25, 24,595 ha of fallow land was brought under rice cultivation. The detailed list of such assistance measures is provided in Table 13.2.

As mentioned earlier, pulses are a marginal crop in Kerala with most of the area devoted to cowpea. Beginning from 2011-12, the production of pulses sharply fell with a few occasional spurts in specific years. The long story here is that pulse production fell from 3,200 MT in 2012-13 to 1,024 MT in 2024-25. One of the reasons is the pressure on cultivable land. Pulses in Kerala are largely a residual rainfed crop after devoting land to all other major crops. Pulses like cowpea can be successfully inter-cropped in homesteads, coconut gardens and tapioca fields, but such potential remains untapped.

In oilseeds, the production of coconut showed a fall between 2011-12 and 2020-21 from 594 crore nuts to 479 crore nuts. There was a revival in coconut production from 479 crore nuts in 2020-21 to 561 crore nuts in 2024-25. The rise in coconut production was owing to improved market conditions and better productive utilisation in value addition, but a large share of the credit must also go to targeted interventions of the State Government through the Coconut Mission

Table 13.2 *Details of assistance given by LSGs for paddy cultivation, Kerala*

Components	Rate of assistance
(a) Rice development schemes	
Assistance for sustainable rice development	Rs 5,500 per ha
Royalty to paddy landowners	Rs 3,000 per ha
(b) Area expansion schemes	
Paddy cultivation in fallow lands	Rs 40,000 per ha
Promotion of specialty rice cultivation	Rs 10,000 per ha
(c) Operational support to padasekhara samithis for group farming	Rs 360 per ha, up to a maximum of Rs 50,000 per padasekharam
(d) Support for infrastructure development in padasekharams	Project-based assistance
(e) Foliar application of micronutrients in rice	Rs 2,000 per ha
(f) Field-level seed multiplication for Pokkali rice	Rs 1 lakh per ha

Source: Department of Local Self-governments, GoK

implemented by the Coconut Development Council after 2018. Under this Council, efforts were concentrated on replanting of coconut at the rate of 75 palms per ward per year in every Panchayat. Between 2019-20 and 2024-25, the Council distributed — at a 50 per cent subsidy rate — 59,95,188 coconut seedlings, including 50,00,678 West Coast Tall (WCT) seedlings, 2,80,439 dwarf seedlings, and 7,14,071 hybrid seedlings.

The Keragramam was another successful intervention in the coconut sector. Between 2014-15 and 2025-26, the Government established 497 Keragramams, each in a contiguous area of 100 ha. This scheme focused on the integrated management of coconut, which included coconut basin ploughing, mulching, Integrated Nutrient Management (INM), Integrated Pest and Disease Management (IPDM), provision of irrigation, production of organic manure, distribution of climbing machines, and initiation of coconut-based value addition units.

There was a marginal revival in the production of arecanut also. Production had fallen from 1.3 lakh MT in 2015-16 to 0.9 lakh MT in 2019-20 but increased afterwards to 1 lakh MT by 2023-24. In 2024-25, production fell to 0.86 lakh MT. Climatic variations, deteriorating soil fertility, and the spread of yellow leaf disease and bud rot are persistent challenges that have adversely affected the production of arecanut.

The production of banana and other plantains holds much promise in Kerala, but the performance over the years has been below potential. Though banana production rose from 5.1 lakh MT in 2011-12 to 5.4 lakh MT in 2020-21, it fell afterwards to 4.6 lakh MT by 2024-25. Banana is vulnerable to extreme climate events, such as heavy rains. The production of the other major food crop of Kerala, tapioca, was largely stagnant in the long run.

Outside the traditional food crops, the production of tea fluctuated within a broad range above and below about 60,000 MT between 2011-12 and 2023-24. In 2024-25, production fell to 57,290 MT. Periods of high growth were regularly punctuated by periods of low growth across this period. In rubber, the production almost halved from 2011-12 till 2015-16 from 8 lakh MT to 4.3 lakh MT. But after 2015-16, rubber production picked up and began to grow slowly, settling at about 6.3 lakh MT by 2024-25. While this constituted a revival, the sector continues to be facing constant threads from frequent imports of natural rubber and competition with synthetic rubber. But there was distinct rise in coffee production in Kerala after a period of decline in production between 2011-12 and 2016-17. If coffee production fell from 68,175 MT in 2011-12 to 63,476 MT in 2016-17, it rose to 68,545 MT in 2020-21 and 70,933 MT in 2024-25.

There was an overall rise in the production of spices and condiments in Kerala over the years, but the rise was concentrated specifically in cardamom. Keeping aside the two climate-stressed years of 2018-19 and 2019-20, the production of cardamom more than doubled from 10,222 MT to 22,869 MT between 2011-12 and 2023-24. In 2024-25 production fell to 18,310 MT. Cardamom could be said to have single-handedly led the revival of spices and condiments, because the production of pepper fell sharply from 46,298 MT in 2012-13 to 29,503 MT in 2024-25, and the production of ginger fell even more sharply from 37,125 MT in 2011-12 to 11,260 MT in 2024-25. The production of other spice crops such as turmeric remained largely stagnant. The improved performance of cardamom — in contrast with other spice crops — as well as the considerable expansion of processing and value addition in spice extracts and oils requires more discussion.

A major achievement of Kerala over the past decade was a significant rise in area cultivated with, and production of, vegetables. Between 2015-16 and 2024-25, the area under vegetables, as classified so in agricultural science, grew from 46,233 ha to 60,135 ha. If we use an expansive definition including fruits, however, the area cultivated stood at 1.2 lakh ha, and production stood at 19.1 lakh tonnes, in 2024-25.

Kerala must be able to rapidly increase its vegetable production and narrow the gap between production and consumption through a mass campaign. The success of seasonal interventions such as "onathinu oru muram pachakkari" (a basket of vegetables for Onam) shows that campaigns must be institutionalised. Productivity of vegetables must be enhanced significantly through innovations, integration of technologies and enterprises, adoption of new varieties, and overcoming irrational fears.

According to the Indian Council of Medical Research (ICMR), the daily requirement of vegetables for an adult is 50 gm of leafy vegetables, 50 gm of roots and tubers, and 200 gm of other vegetables. Assuming population as 3.4 crore, the State Planning Board estimated that Kerala needs to annually produce 6.2 lakh tonnes of leafy vegetables, 6.2 lakh tonnes of roots and tubers, and 24.8 lakh tonnes of other vegetables. Together, this translates to 10,212 tonnes of vegetables per day or 37.2 lakh tonnes of vegetables per year.

The total production of vegetables in 2024-25 was 4.8 lakh tonnes. If considering vegetables, tubers and ginger in an expansive definition, the total production in 2024-25 was 14.6 lakh tonnes. Either way, Kerala needs to travel a long way before to attain a level near self-sufficiency.

In consultation with experts, detailed plans are available to meet targets in vegetable production. These plans, at the Agro-Ecological Unit (AEU)-level, includes production protocols, selection of suitable varieties and hybrids, timely availability of planting material, use of weather advisory services, expansion of irrigation including micro-irrigation, adoption of integrated nutrient management and integrated pest management, adoption of open precision farming in commercial tracts and rain shelters for nutri-gardens, plans for protected cultivation in urban and peri urban areas, appropriate marketing interventions, and establishment of sufficient cold storage facilities. In all these efforts, the role of LSGs, cooperatives, and Farmer-Producer Organisations (FPO) will be paramount.

This reveals that a comprehensive and multi-pronged initiative is necessary to maintain the momentum of growth revival in the crop sector. This initiative must be multidisciplinary and interdisciplinary; must ensure maximum convergence across line departments, such as agriculture, animal husbandry, dairy, fisheries, cooperation, water resources, industry, and local self-governments; must focus on the twin goals of scientific management of agriculture and climate adaptation; and must take the form of a participatory and inclusive State-level campaign.

Studies and analyses at the State Planning Board show that there are three important challenges that the agricultural sector in the State faces today:

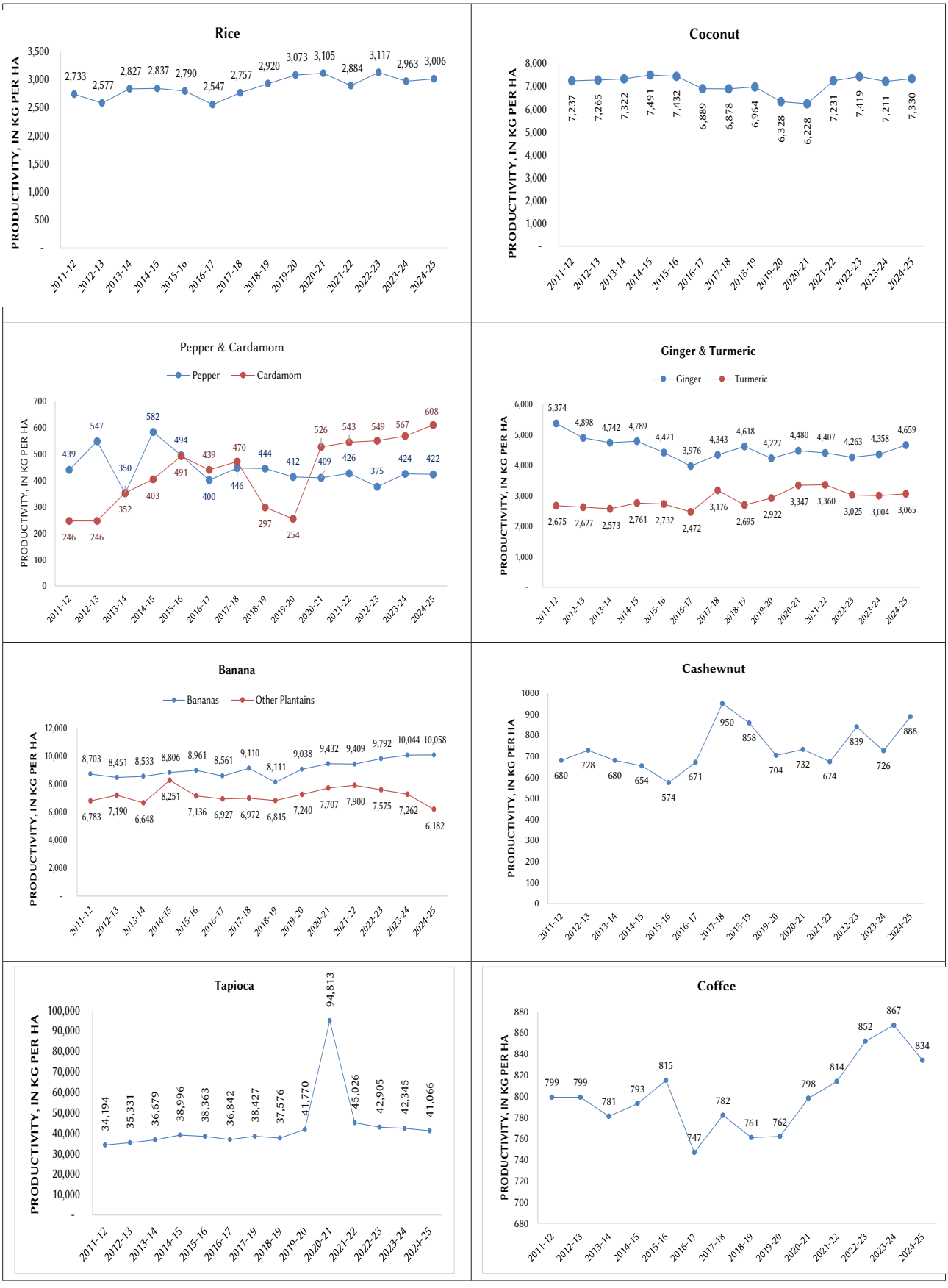
- Poor levels of yield in a range of crops;
- Absence of facilities for aggregation and marketing of crops; and
- Inability to link farmer's produce to industrial investments in value-addition.

Following sections willl elaborate on each of these challenges.

Bridging the Yield Gaps

Low levels of yield in most of the major crops have been a weak point in Kerala's agricultural history.

The inability of the State to generate adequate growth of agri-business is critically linked to low crop yields. Agri-business is often incompletely understood as investments in value addition alone. In fact, agri-business refers to the larger business of agricultural production, which includes production,


Rice
PRODUCTIVITY, IN KG PER HA
2,733 2,577 2,827 2,837 2,790 2,547 2,757 2,920 3,073 3,105 2,884 3,117 2,963 3,006
Coconut
PRODUCTIVITY, IN KG PER HA
7,237 7,265 7,322 7,491 7,432 6,889 6,878 6,964 6,328 6,228 7,231 7,419 7,211 7,330
Pepper & Cardamom
Pepper
Cardamom
PRODUCTIVITY, IN KG PER HA
439 547 350 582 494 400 446 444 412 409 426 375 424 422
246 246 352 403 491 439 470 297 254 526 543 549 567 608
Ginger & Turmeric
Ginger
Turmeric
PRODUCTIVITY, IN KG PER HA
5,374 4,898 4,742 4,789 4,421 3,976 4,343 4,618 4,227 4,480 4,407 4,263 4,358 4,659
2,675 2,627 2,573 2,761 2,732 2,472 3,176 2,695 2,922 3,347 3,360 3,025 3,004 3,065
Banana
Bananas
Other Plantains
PRODUCTIVITY, IN KG PER HA
8,703 8,451 8,533 8,806 8,961 8,561 9,110 8,111 9,038 9,432 9,409 9,792 10,044 10,058
6,783 7,190 6,648 8,251 7,136 6,927 6,972 6,815 7,240 7,707 7,900 7,575 7,262 6,182
Cashewnut
PRODUCTIVITY, IN KG PER HA
680 728 680 654 574 671 950 858 704 732 674 839 726 888
Tapioca
PRODUCTIVITY, IN KG PER HA
34,194 35,331 36,679 38,996 38,363 36,842 38,427 37,576 41,770 94,813 45,026 42,905 42,345 41,066
Coffee
PRODUCTIVITY, IN KG PER HA
799 799 781 793 815 747 782 761 762 798 814 852 867 834

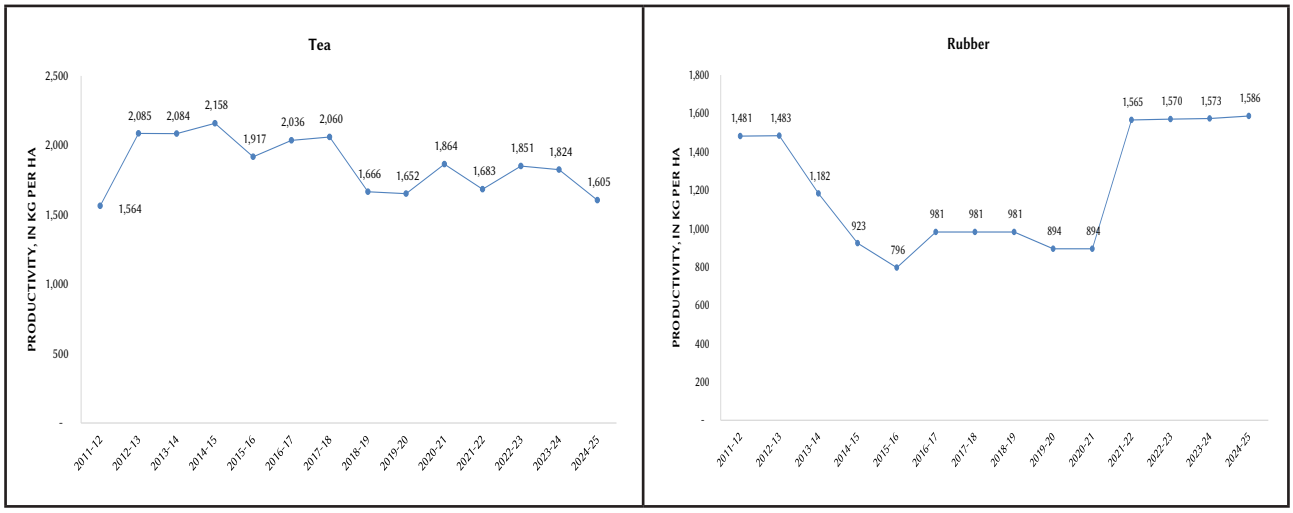


Figure 13.9 *Trends in the yields of selected major crops, Kerala, 2011-12 to 2024-25* in kg per ha and nuts per ha
Source: Department of Economics and Statistics, GoK, Rubber Board, Coffe Board, Coconut Development Board, Spices Board, and DCCD

processing, marketing, financing and distribution of inputs and products. In other words, it encompasses pre-production, production and post-production activities. Consequently, the evolution of agribusiness is organically linked to how agricultural production is organised. This is where scale matters, and this is why yields matter too.

Trends in yields

The period of revival of agricultural growth in Kerala was broadly associated with an increase in yields of specific crops (Figure 13.9). However, even when yields rose, they remained lower than the average is at the national level or in the best performing States. In certain other crops, yields continued to decline in the recent years, which is a matter of concern.

In rice, there was a distinct increase in yields from 2.5 tonnes per ha in 2016-17 to 3 tonnes per ha in 2024-25, with yields crossing the mark of 3 tonnes per ha in four years. A distinct increase in yield was also visible in banana, coffee, cardamom, and turmeric. In the case of rubber, there was a reduction of yield for close to a decade after 2012-13 but they recovered in the period after 2020-21. On the other hand, the yields in coconut remained low and even declined in the long run. But a more distinct decline in yields was visible in tea, pepper, and ginger.

Being the most value-adding sectors in the State's agriculture, the declining yield of spices other than cardamom is a matter of concern. In 2019, the Indian Council of Agricultural Research (ICAR) noted that "low productivity is one of the serious problems that the Indian spice industry is facing and this, in turn, causes low competitiveness in international markets". In its futuristic Vision 2050 document, the Indian Institute of Spices Research (IISR), Kozhikode pointed out that there was "great scope to improve the productivity of major spices as the potential yield realized in the research station and at the progressive farmers plots are very high and well above the national average".

Data on yield gaps

The yield gap is defined as the difference between the actual average yield and the maximum attainable yield (or the potential yield) in each crop. [1]

To obtain robust data at the level of zones, the State Planning Board commissioned a study by the Kerala Agricultural University titled "Yield Gap Analysis of Major Crops and Impact Analysis of Jaiva Griham (IFS) Project in Different Agroecological Units of Kerala". In 2024-25, a survey was conducted in each of the 23 agroecological units covering 13 crops.

Figure 13.10 shows graduated maps of the yield gaps in all the 23 agroecological units of Kerala. The broad conclusion that emerges is as follows. Across the units, the range of the yield gap in rice was between 190 per cent and 42 per cent; in coconut was between 313 per cent and 37 per cent; in arecanut was between 852

[1] The maximum attainable yield is variously defined as the average yield in a benchmark region, or the maximum yield attained in field experimentation conditions, or the maximum yield attained in a farmer's field. The yield gap, then, is estimated as follows:
Yield gap (%)= {[(Potential yield -Average yield)÷Average yield] ×100}

per cent and 16 per cent; in pepper was between 723 per cent and 10 per cent; in cardamon was between 355 per cent and 32 per cent; in nendran banana was between 280 per cent and 1 per cent; in tapioca was between 405 per cent and 31 per cent; in cashew was between 221 per cent and 21 per cent; in cocoa was between 237 per cent and 10 per cent; in coffee was between 211 per cent and 62 per cent; in rubber was between 585 per cent and 7 per cent; in tea was between 49 per cent and 34 per cent; and in sesamum was between 413 per cent and 178 per cent.

The reasons for the yield gaps varied across zones, but were universally associated with the planting of the crop in suitable soils, weather conditions, rainfall conditions, and drainage conditions. Clearly, this showed the importance of designing scientific land use plans and crop plans, and the use of appropriate soil test results. In addition:

- In rice, lower yield gaps were associated with improved adoption indices in seed rate, spacing, application of pesticides, and application of inorganic and organic fertilisers.
- In coconut, lower yield gaps were associated with the adoption of high yielding varieties, recommended spacing, appropriate application of organic manure, and plant protection measures.
- In banana, lower yield gaps were associated with adoption of improved varieties, spacing and the application of inorganic and organic fertilisers.
- In pepper, lower yield gaps were associated with better adoption of high yielding varieties, organic manure and pesticide application.
- In rubber, lower yield gaps were associated with better adoption of all the recommended practices including the application of organic matter. Higher yield gaps were associated with the cultivation of the crop in unsuitable soil and climate.
- In arecanut, lower yield gaps were associated with better adoption of high yielding varieties, use of lime and organic matter, and plant protection measures.

Improved varieties and quality seeds

Though the exploitation of genetic potential is the most critical factor in raising yields, the rate of adoption of modern varieties in Kerala remains low except in paddy, rubber, and vegetables. Adoption rates in modern varieties must rise to at least 70 per cent in all the major crops. To balance improved and local varieties, it is suggested that in crops like coconut, a ratio of 60:20:20 must be maintained between local tall, hybrids, and dwarf varieties for overall sustainability.

A corollary is to ensure the availability of quality seeds and planting material, which is another important constraint in raising yields. Presently, the planting materials made available by the public institutions are unable to meet the demand. This necessitates the modernisation of Government farms and seed farms for the mass production of improved seeds and planting material, widespread accreditation of private nurseries as in the case of rubber, and provision of support to FPOs and other collectives for production and the distribution of quality seeds and planting material. With public sector research institutions in the lead, the protection of planting material must thus be decentralised with attention paid to capacity-building through the sharing of germplasm, training and monitoring. Robust certification protocols must also be established to maintain quality.

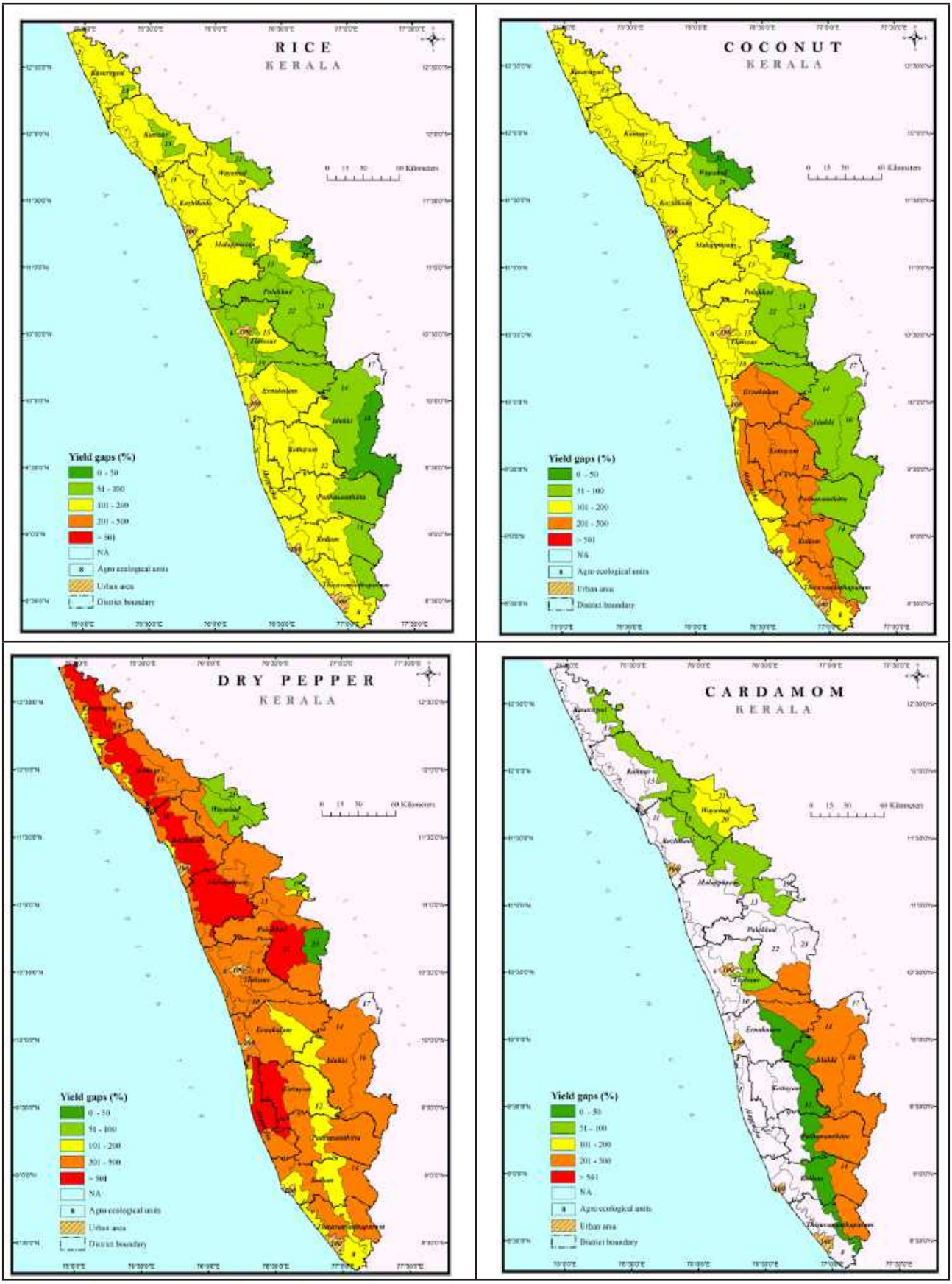
Soil management

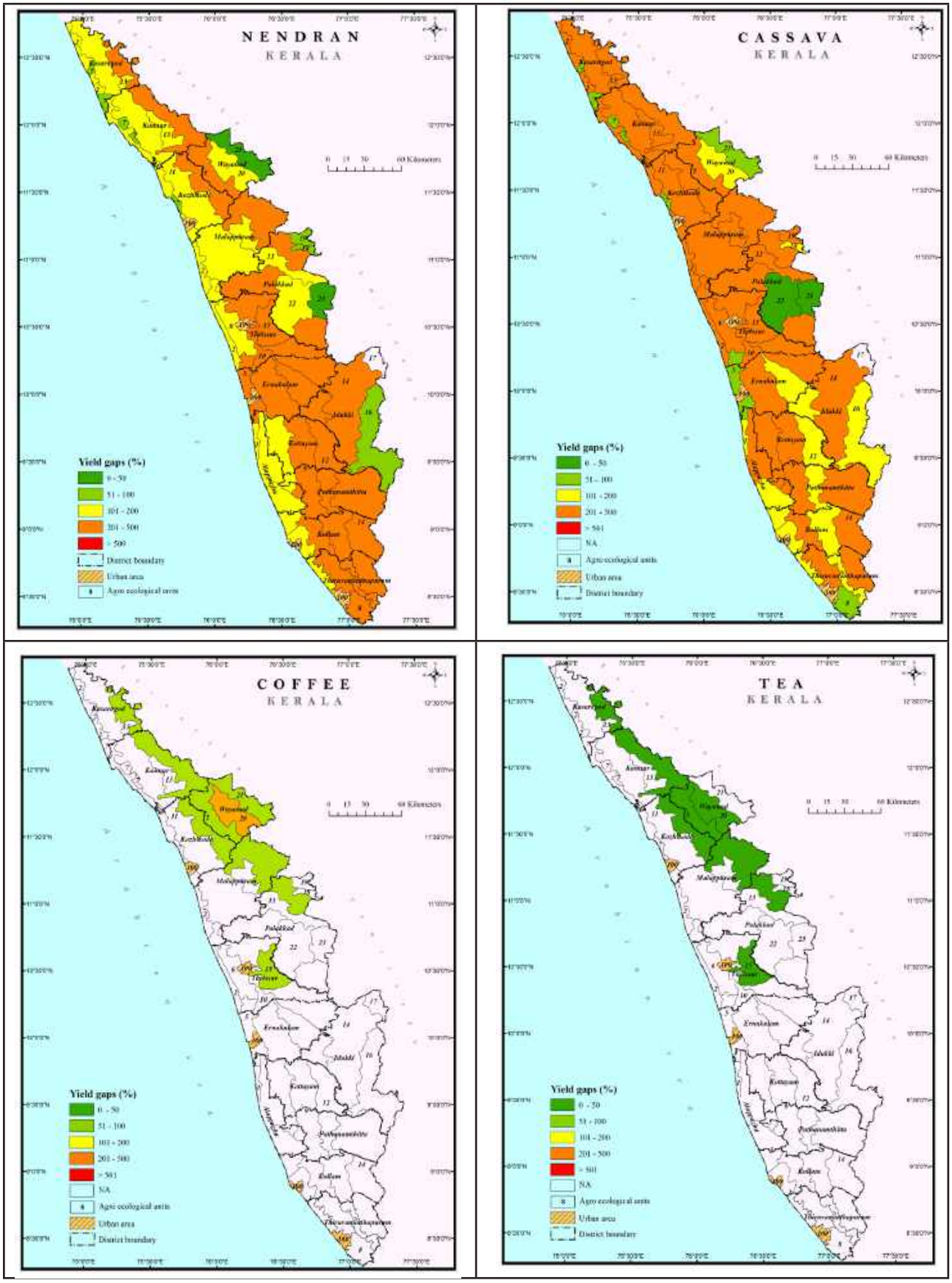
A good proportion of Kerala's soils are deficient in major and minor nutrients. About 91 per cent of the soils are acidic. The proportion of soils deficient in available nitrogen is 34 per cent; available phosphorus is 37 per cent; available potassium is 31 per cent; available calcium is 59 per cent; available magnesium is 79 per cent; available sulphur is 56 per cent; and available boron is 64 per cent. Frequent floods and heavy rains further deteriorate soil health, including through a drain of organic carbon. These features of Kerala soils underline the importance of soil testing and integrated nutrient management– one that uses a conjunction of organic and inorganic fertilisers.

In soil testing, the primary tool of intervention is the Soil Health Card (SHC) scheme of the Government of India from 2014-15 (later merged with the Rashtriya Krishi Vikas Yojana in 2022-23). The scheme's objective was to provide each farmer with a SHC, containing 12 parameters, once every three years.

The SHC scheme suffers from numerous deficiencies, and the progress has been slow. As only one soil sample will be collected from each grid, all farmers within each grid receive the same test results in their SHC. The size of the grids is not based on soil variability indices, typically developed at the Block-level, where grid sizes are reduced if variabilities are large. If variabilities are very high, at least one sample from each plot would be required for robust results. Essentially, this defeats the purpose of soil-specific recommendations, and needs to be rectified.

Furthermore, the levels of inorganic fertiliser consumption in Kerala are one of the lowest among Indian


RICE
KERALA
COCONUT
KERALA
DRY PEPPER
KERALA
CARDAMOM
KERALA
Yield gaps (%)
0 - 50
51 - 100
101 - 200
201 - 500
> 501
NA
Agro ecological units
Urban area
District boundary


NENDRAN
KERALA
Yield gaps (%)
0 - 50
51 - 100
101 - 200
201 - 500
> 500
District boundary
Urban area
Agro ecological units
CASSAVA
KERALA
Yield gaps (%)
0 - 50
51 - 100
101 - 200
201 - 500
> 500
NA
Agro ecological units
Urban area
District boundary
COFFEE
KERALA
Yield gaps (%)
0 - 50
51 - 100
101 - 200
201 - 500
> 500
NA
Agro ecological units
Urban area
District boundary
TEA
KERALA
Yield gaps (%)
0 - 50
51 - 100
101 - 200
201 - 500
> 500
NA
Agro ecological units
Urban area
District boundary

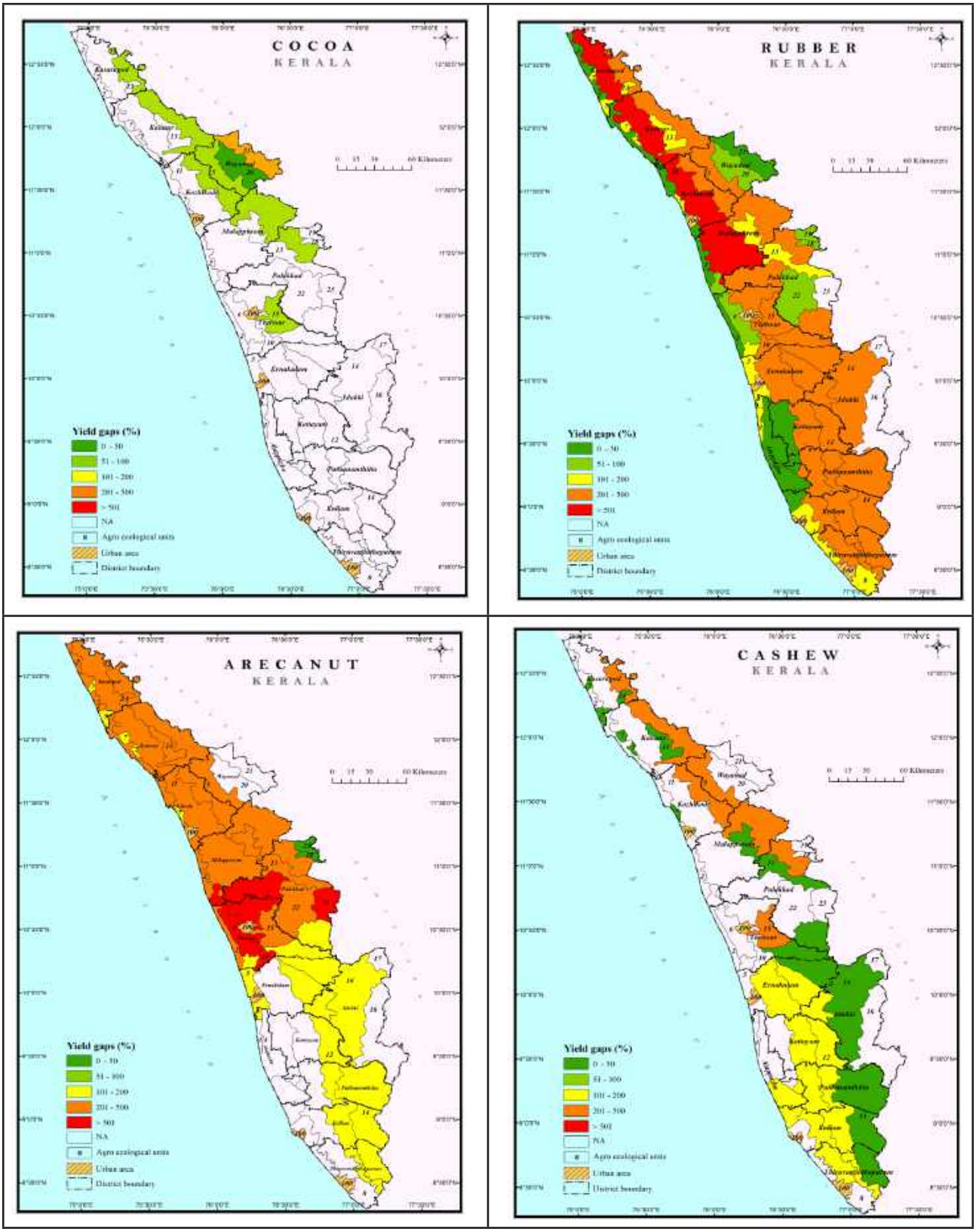


Figure 13.10 *Yield gaps in selected crops across the 23 agroecological units, Kerala* in per cent
Source: Report of the Kerala Agricultural University
Note: AEUs marked in white are those from which no samples were available or drawn.

Table 13.3 *Results of laboratory studies on pesticide residues in food samples, Kerala, January 2024 to March 2025* in number and per cent

Product sampled	Number of samples analysed	Number of samples with residues above FSSAI MRL		Number of samples with residues of off-label pesticides	
		Number of samples	Share of samples (%)	Number of samples	Share of samples (%)
Vegetables	1,174	17	1.4	263	22.4
Fruits	251	9	3.6	77	30.7
Spices	155	47	30.3	100	64.5
Cereals	138	6	4.3	13	9.4
Pulses	135	0	0.0	16	11.9
Herbs	76	0	0.0	57	75.0
Fish/Marine	62	0	0.0	0	0.0
Meat/Egg	318	0	0.0	0	0.0
Milk	61	0	0.0	0	0.0
Water	45	0	0.0	0	0.0
All products	2,415	79	3.3	526	21.8

Source: Compiled from data on MPRNL

States– at wide variance with the recommendations in the official Package of Practices. In 2013-14, Kerala's consumption of Nitrogen, Phosphorus, and Pottassium fertilisers was 125 kg per ha of gross cropped area. But in 2024-25, the consumption fell to 62 kg per ha of gross cropped area, which was the lowest among all Indian States. The corresponding national average in 2023-24 was 139.7 kg per ha of gross cropped area. In short, the task of integrated nutrient management remains unfulfilled in Kerala's crop sector.

Integrated pest management

The poor implementation of integrated pest management programmes, combined with a chemophobia triggered by irrational fears, has contributed to the lack of a scientific approach to pesticide application in Kerala's farms.

Kerala Development Report in 2021 outlined – from a scientific perspective – the need to check if pesticide residues are present above the Maximum Residue Limits (MRL) fixed by the Food Safety and Standards Authority of India (FSSAI). In addition, food items purchased from the market are regularly scrubbed, washed with water, and boiled or steamed in cooking. These everyday procedures in the kitchen ensure that any remaining residues in trace amounts are also eliminated.

In India, the standard and widely accepted method to examine pesticide residues is to use the data from the central sector scheme titled Monitoring of Pesticide Residues at National Level (MPRNL), which aims at regular testing of food samples across India. The scheme samples and analyses food samples from retail outlets, APMC markets, mother dairy, organic outlets and farm gate. In Kerala, two labs are accredited to this scheme: one at the College of Agriculture, Vellayani and the other at Marine Products Export Development Authority (MPEDA), Kochi.

Together these two labs analysed 2,415 samples of food items between January 2024 and March 2025, the largest sample drawn being of vegetables. Strikingly, only 3.3 per cent of the total samples, and just 1.4 per cent of the vegetable samples, had residues above the MRLs fixed by FSSAI. In fact, it was spices that had the largest share of samples with residues above the MRLs at 30.3 per cent.

Another finding is that off-label pesticide residues were found in 21.8 per cent of samples. The

corresponding shares in vegetables were 22.4 per cent, in fruits was 30.7 per cent, and in spices was 64.5 per cent. In other words, the real problem to be addressed is the misuse of chemicals not recommended by the scientific establishment for use in each crop. No MRLs are available for such chemicals from the FSSAI though a limit of 0.01 mg/kg has been in place for spice exports. Farmers use different types of unregistered chemicals in the farm at indiscriminate rates due to the failure of the agricultural extension mechanism in providing them the right technical advice.

Pesticide residues in spice exports. Kerala is one of the world leaders in the production and export of spices, such as pepper, cardamom, turmeric, and ginger. In the recent years, concerns have been raised by international buyers (particularly the EU, US, and Australia) over pesticide residues exceeding Maximum Residue Limits (MRLs). This has led to rejections and economic losses for Indian exporters, many of whom are based in Kerala.

These residues need to be analysed. They may arise because farmers may be overusing pesticides owing to lack of awareness or heightened pest resistance. In some cases, farmers may be resorting to premature harvesting without allowing for a sufficient pre-harvest interval needed for the degradation of the applied chemicals. In other cases, contamination may happen during post-production handling or transport.

Kerala's policy must be founded on science-based solutions and not blanket bans or knee-jerk advocacies. It must put emphasis on the adoption of Good Agricultural Practices (GAP) by investing in integrated pest management that reduces reliance on chemical pesticides. Modernisation of post-production activities like transport storage and processing can significantly reduce residues. The extension system must be equipped to create awareness among farmers on the use of scientific dosages, adoption of pre-harvest intervals, and the spread of validated biopesticides. Focus must also be

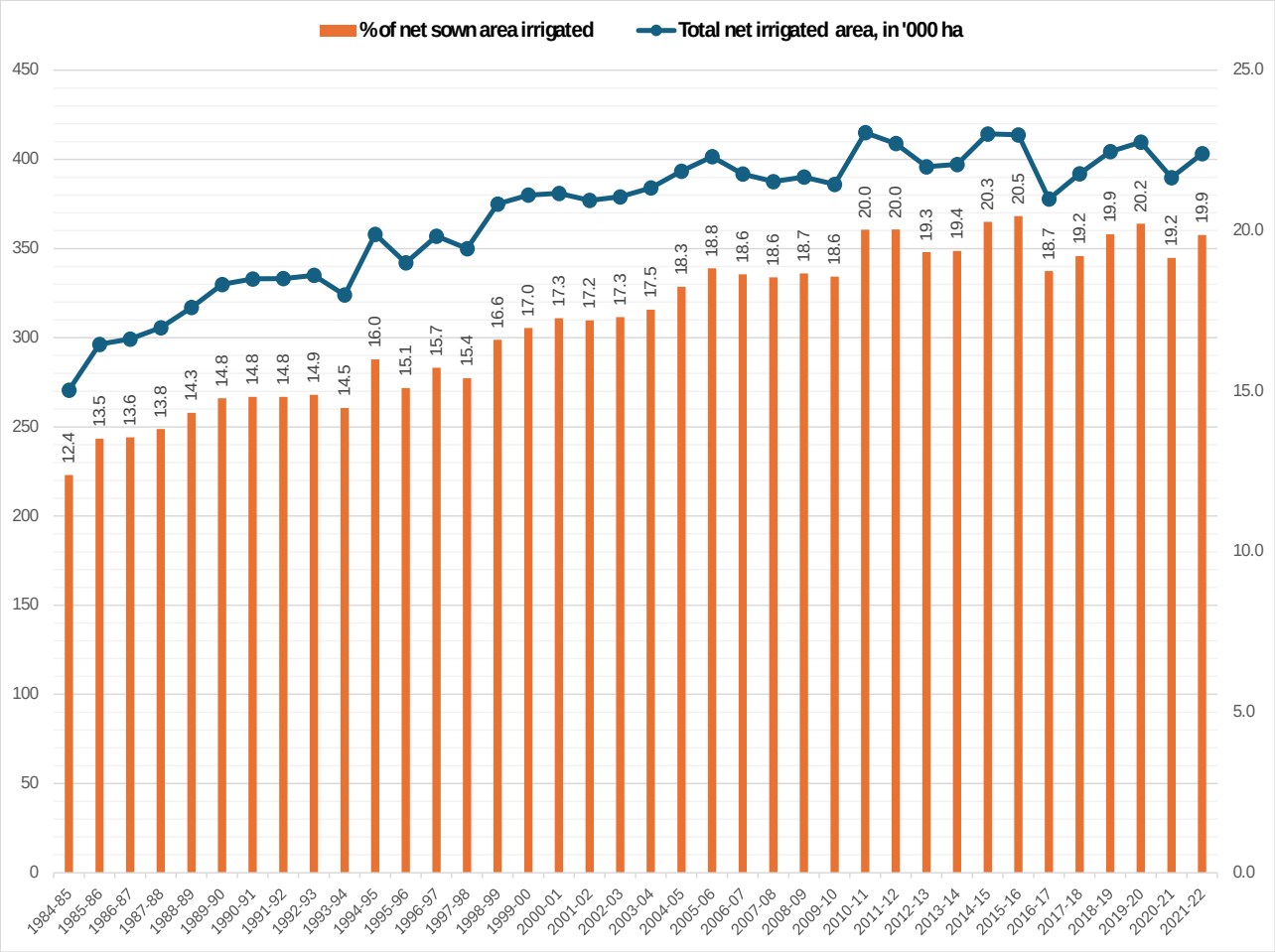


Figure 13.11 *Total irrigated area and share of area irrigated, Kerala, 1984-85 to 2021-22* in '000 ha and per cent
Source: Department of Economics and Statistics, GoK

given to strengthening the laboratory infrastructure for residue analysis. Finally, Kerala must begin discussions with the Government of India on aligning the FSSAI standards with global standards like EU and Codex after widespread consultations with scientists and farmers.

Water management

Kerala urgently needs to intensify the linkages between irrigation projects and productivity growth, particularly in spices, coconut, banana, vegetables, and fruits. The flow of 41 West-flowing rivers is a unique feature of Kerala's geography. However, a large part of this water is unutilised and flows out into the sea. As Figure 13.11 shows, the extent of irrigated land in the State has remained unchanged, if not declined, after 2011-12. The share of net sown area irrigated has consequently stagnated at around 20 per cent for many years. Large and medium irrigation projects have historically focused on paddy lands, and missed focus on crops like coconut, vegetables, banana, spices, and plantation crops. Watershed-based planning at the local level has not been upscaled beyond a handful of local experiments.

An important possibility in this sphere is the adoption of micro-irrigation. The water use efficiency (WUE) in Kerala's agriculture is estimated between 35 per cent and 40 per cent in canal irrigation and about 60 per cent in groundwater irrigation. Such low WUEs are attributed to the conventional flood method of irrigation, in which there are major conveyance losses as well as wasteful water use in the fields. Micro-irrigation helps to significantly increase WUE, particularly in areas that are water-stressed. Studies show that WUE can be increased by a minimum of 20 per cent if micro-irrigation is adopted, alongside attendant gains in crop yields.

While Kerala is eminently suited for the adoption of micro-irrigation, its spread has been poor. Micro-irrigation must be a core focus of agricultural policy in the next five years. The Haritha Keralam Mission and the Department of Water Resources may act as the nodal agencies. Existing rural collectives, such as cooperatives, FPCs, and Kudumbashree groups must be encouraged to take up micro-irrigation initiatives in larger tracts of land, which can act also as demonstration plots in different local environments. Every Panchayat must have at least one demonstration plot on the use of micro-irrigation in agriculture. The distribution of many Government subsidies can also be made contingent on the adoption of micro-irrigation in the farmer's fields.

Improving Aggregation and Marketing

The lack of facilities to aggregate farmer's produce, as well as of institutional facilities in marketing constitute a second challenge in Kerala's agriculture. The individual lots of production of lakh of small and marginal farmers lie fragmented outside the farm gate. As a minimum scale is necessary for market connectivity, small holdings with lower marketed surplus per farmer are deprived of their bargaining power. Further, without efficient aggregation, transaction costs can be very high in transport, handling, and storage. Also, problems in aggregation spillover into connected problems in building an efficient supply chain as well as in making scaled-up raw material supplies available for agricultural processors.

Thus, the presence of aggregation is important in agriculture for multiple reasons. First, it ensures access to stable markets for agricultural produce and allows farmers to move their material to any primary market of their choice. Secondly, it helps ensure remunerative prices to farmers. Lack of choice in markets opens spaces for extant multi-layered transactions, leading to more middlemen and more costs and margins. Thirdly, it ensures efficient linkages of production with agri-logistics. In the presence of aggregation, farmers in villages can reach out and link up with multiple first-stage wholesale buyers, such as processors, traders, retailers and exporters. Thus, better integration can be ensured with value-addition activities.

Kerala must use its historical strengths to address the challenge of aggregation. It must use a carefully designed combination of the deeply embedded cooperatives, empowered LSGs, platforms of farmer producer companies, and the widespread Kudumbashree groups to create multiple local and federated institutions that would bridge the gap between production and value-addition. The single most important objective here must be to achieve economies of scale both at the farm gate as well as outside it in the spheres of sales, transport, handling and storage.

Scale on the farm

Land leasing. Facilitating and creating a conducive atmosphere for the leasing of fallow or poorly utilised land can generate possibilities of pooling and creating larger plots of land in cultivation itself. In Kerala, large extents of cultivable land are owned by persons who either have little interest in cultivation or are absentee owners who leave their land fallow. On the other hand,

there are several landless or marginally landed persons who retain an interest in cultivation for livelihoods or with an eye on the business of agriculture. New thinking on land leasing can act as a bridge across these two sections and help create scale in production – apart from bringing new land into cultivation.

Kerala is one of the few States in India that legally eliminated tenancy as part of land reform. Public memory is still fresh with memories of the deeply oppressive forms of tenancy followed by *janmi* landlords till the 1950s. It is natural, then, that suggestions to reintroduce tenancy will lead to concerns.

From the 1980s, Kerala witnessed the slow emergence of informal leasing of paddy lands and coconut lands. From 1999, the Government took executive measure to regulate these new forms of tenancy. From the early-2000s, Kerala also began to witness the emergence of self-help groups (SHGs) and joint liability groups (JLGs) of landless women that leased-in land for the cultivation of paddy, vegetables and fruits. Thus, there are currently three forms of tenancy practised in the State.

- leasing of land by individuals for cultivation of field crops
- leasing of land by individuals for cultivation of fruits and vegetables
- leasing of land by SHGs and JLGs of women for the cultivation of field crops, fruits and vegetables

With regard to the first, the Farmer's Welfare Board set up under the Department of Agriculture and Farmer's Welfare provides for membership of landowning farmers (up to 15 acres), sharecroppers and tenant farmers. The Department also provides a per-acre subsidy for individuals who lease-in land for cultivation. Wherever needs for credit arise, the local Agricultural Officer (AO) provides a statement, which can be used to avail of credit from the local banks.

With regard to the second, the Vegetable and Fruit Promotion Council Keralam (VFPCK), an agency under the Department of Agriculture and Farmer's Welfare, actively intervenes to facilitate land leasing arrangements between individuals and landowners. Every leasing arrangement is backed up by a written agreement between the lessee and the local bank, which is attested by the concerned local officer of VFPCK. This document allows for easy credit availability for the tenants.

With regard to the third, 51,883 acres of land in the State were leased by JLGs for cultivation in the agricultural year of 2024-25. The Kudumbashree Mission had 99,259 active JLGs across the State in 2024-25, which had 4,52,912 active female farmer members, which is the largest number of farmers enrolled anywhere in India. The JLG model here is of an integrated value chain (VC), whereby the groups can establish cost advantage by sourcing inputs at the cheapest possible costs, using own labour, interest free finances and subsidies of various sorts. These lease contracts are overseen and monitored by the Kubumbashree Mission. The Mission ensures that there is a three-way written lease agreement on a stamped white paper between the landowner, the President of the SHG/JLG and either the local Ward Member or the block coordinator of Kudumbashree or a locally prominent individual. This agreement, with a 11-month validity, can also be used by the SHG/JLG to present at the bank to avail credit. The rent paid by the JLGs varies according to the extent of land leased in and the crop grown. In fact, independent scholars have argued that this scheme is a model to emulate for other States, where one allows for economies of scale to emerge without relying on traditional modes of tenancy and while proactively protecting rural livelihoods.

With regard to these three forms of tenancy, there have not been any major complaints in Kerala, such as the problems of return of land or of the denial of credit from banks. The State Government or the local Panchayat immediately intervenes when issues arise and resolves the conflicts, if any.

In sum, Kerala has already revised proactive measures to regulate tenancy. Even the Niti Aayog's Model Agricultural Land Leasing Act, 2016 cites the Kudumbashree experiment as an illustration for increasing efficiency and viability in farming.

Kerala must aim to double or triple the extent of land under such leases in the next five years. If successful, it can reduce the extent of fallow land to a minimum and create many new farms that have the advantages of scale as well as the presence of cultivators with an incentive to invest in new technologies. This can also be a launchpad for production that aims at niche export markets. But before initiating such a large State-level exercise, it may be useful to reexamine its legal basis and ensure a favourable atmosphere that would accommodate different kinds of tenancy contracts.

Contract farming. Apart from land leasing, another instrument that could be used to create scale in production and marketing is the introduction of

contract farming. Unlike other States, Kerala never passed an Agricultural Produce Marketing Committee (APMC) Act. Consequently, there is no legal bar to engage in contract farming (or even open a private market) in Kerala. There are already multiple active examples of contract farming in the State- all of which aim to ensure scale and uniformity of quality and grade. We shall provide just six examples below.

- Contract farming is widely prevalent in Kerala's spices sector. In the production of oleoresin and spice extracts, many private firms enter into purchase contracts with spice growers in Kerala's highlands.
- Private companies like Synthite have arrangements with farmers in the Sholayar and Attappadi regions to source Integrated Pest Management (IPM)-compliant cardamom for exports to countries like Japan. Small cardamom is preferred in these contracts.
- Organic exporters like the Peermade Development Society (PDS) and Bergwerf Organics have contracts with farmers and farmer's groups in Idukki district for sourcing spices like ginger, turmeric and pepper. The organic certification of these products is also facilitated by the exporters.
- Karnataka-based companies like Expo Van, have been signing contracts with vanilla farmers in Kerala to purchase vanilla at pre-determined prices.
- Many farmers of North Kerala, who cultivate crops like Safed Musli, also enter into contracts with private companies outside the State for sale of their harvest.

Contracts farming actively exists in broiler farming in Districts like Wayanad. Here, a company or a cooperative supplies young chicken to households to grow them until a certain age. These companies also provide chicken feed, veterinary services and technical know-how to the households as part of the contract. The household sells back the chicken to the company after a certain number of weeks at a pre-determined price. Private companies based in Udumalpetta, such as Suguna Chicken, have developed templates for contracts, also known as Suguna Integration Model.

The proliferation of contract farming practices that contribute to economic growth also carries with it a need for regulation and the institution of grievance redressal measures.

Scale in procurement

Outside the farm gate, Kerala must institute new measures to improve collection and procurement mechanisms in rice and coconut. In both these crops, Kerala must experiment with collective institutions, including Primary Agricultural Cooperative Societies (PACS), Farmer Producer Companies, and Kudumbashree groups. The key reforms that could be introduced in the procurement of paddy and coconut are as under.

Reforms in paddy procurement. Making the paddy procurement system more efficient is a continuing task. A new report of the committee appointed by the Department of Agriculture has recommended that Paddy Procurement Centres (PPC) be established in every Panchayat, which will be managed by a local PACS. These PPCs will be equipped with dryers, winnowing machines, weighing scales, grain analysers, moister meters, computers and other necessary accessories. Where PACS are not available or willing, the private sector may also be tapped to establish PPCs. The PACS may adopt different methods to pass on the procured paddy to the next link in the chain. PACS may process the paddy themselves and sell it domestically; or may sell it to the millers; or may sell it to the open market.

Going forward, capacity building will be a key necessity. Some PACS may also need financial assistance in the beginning. To ensure adequate paddy for the Public Distribution System, a certain share/quantity may be fixed for sales to the Government.

Key gains from the new system are: (a) the farmers will get immediate payment; (b) financial burden on the State Government is reduced; (c) political mobilisation of PACS becomes possible, which can have spillover effects in other crops also; (d) the administrative inefficiency in the present system can be reduced; and (e) there will be a transparent mechanism of a unified real time digital platform available in procurement.

Reforms in green coconut procurement. The existing mechanisms for procurement of coconut are inadequate. The Kerafed, established in 1987, is an apex institution operating through 100 primary cooperative societies. This is a procurement agency registered under National Agricultural Cooperative Marketing Federation of India Ltd (NAFED) and operates the largest coconut oil brand – KERA – in Kerala. The Expert Sub-Group report of the 14th Five-Year Plan observed that the primary co-operative societies under Kerafed have very limited infrastructure facilities for processing, mostly

procure from other States, and do not effectively utilise the copra processing facilities.

The Department of Agriculture and Farmers' Welfare initiated the Green Coconut Procurement scheme in 2013. Here, green coconut was directly procured from the farmers at Rs 34 per kg of green coconut. However, this scheme has not been successful due to poor implementation and the lack of storage facilities, and the system has proved to be ineffective in ensuring the quality of the nuts procured.

Presently, NAFED has a scheme of procurement of copra for six months in a year. They have set a limit of procuring 50,000 MT of copra from Kerala. The State Government can make use of this scheme, as the prices will paid by NAFED and only the difference needs to be covered by the State Government. If NAFED procures 50,000 MT of copra, it translates to the domestic procurement of 1,65,000 MT of green coconut. But in 2023-24, Kerala could procure only 20,719 MT of green coconut from the farmers. In other words, Kerala can aim to increase the procurement of green coconut procurement in Kerala manifold and supply them to NAFED at a low financial burden. The only matters that would remain are: (a) the institution of an efficient procurement system in the State; and (b) the institution of a viable system of processing green coconut into copra before selling to NAFED.

The State Planning Board organised detailed discussions on this issue with various stakeholders, and found that the VFPCK had the most viable cost structure.

In a proposed model, the VFPCK with its supply chain that integrates producers through SKSs (Swasraya Karshaka Samithi), which initiates primary collection and marketing through farmer's markets. (Swasraya Karshaka Vipani can be used to expand procurement and processing of green coconut in Kerala.)

New marketing institutions

In marketing, Kerala must build a regulated supply chain network for the major commodities. Presently, the supply chain is fragmented and riddled with the presence of numerous intermediaries like traders, distributors and resellers who appropriate high margins. As a result, farmers experience price risk, information asymmetry, distribution inefficiency, and delayed payments. Retailers face the problems of higher costs, lower quality, higher price volatility, and more frequent purchase burdens.

The State Planning Board has prepared a blueprint for a new supply chain network in agriculture. Kerala needs region- and crop-specific aggregation strategies to manage market gluts and make available commodities at scale to those who are prepared to add value. There must be a promotion of information and communication technology to its fullest extent to promote aggregation and achieve supply chain efficiency. The Department of Agriculture has initiated work on a large project – KERA – funded by the World Bank in this sphere (Box 13.1).

Box 13.1
The Kera Project

The launching of the Kerala Climate Resilient Agri-Value Chain Modernisation Project (KERA) aims to promote the resilience and commercialization of Kerala's food and agriculture sector. KERA is a five-year World Bank-funded project, approved by the Government of India in October 2022. The corpus fund for the project is 285 million US dollars (Rs 2,356.5 crore) with World Bank assistance of 200 million US dollars (Rs 1,655.9 crore) and a State share of 85 million US dollars (Rs 709.7 crore). The main objective is to promote the resilient commercialisation of Kerala's food and agriculture sector for small holder farmers and agri-based MSMEs. The project will support the piloting and scaling up of innovations and investments in the upgradation of agricultural supply chains and value chains, empowerment of Agri-food based MSMEs and FPOs, creation of sustainable market infrastructure and efficient management models by taking inputs from various cross-national practices. The project is intended to enervate the local economy through investment in agriculture and allied sectors by adopting climate resilient agricultural practices. The World Bank approved the project in October 2024, and the project commenced in November 2024.

This chapter suggests a hub-and-spoke model for aggregation. In the model, a centralised hub can be developed from which the products originate or to which products can be sent from the local points and can be distributed further. The hubs and local centres should have backward and forward linkages to collect the products to the maximum and clear the markets with zero or near-to-zero wastage with minimum cost. The central agency at each hub and each spoke must be a cooperative, or a similar collective of farmers. The SAFAL model operating in Delhi is a good example.

In practice, this means that Kerala needs a minimum of one primary rural agricultural market (PRAM) in every Panchayat, equipped with cold storage facilities, which should act as a feeder market for larger markets at the Block and District levels. Every farmer or farmer's cooperative or farmer's producer company must be linked to these PRAMs with facilities for assembly, auction and assaying. Efforts must also be made to create federations of markets, to ensure viable linkages with value addition and processing sectors.

The operation of this model via the cooperative sector, with their own funds, will ensure that the financial burden on the State Government will be minimum, and that the system will run with an internal momentum to break even. For this purpose, the concerned cooperatives must be freed from the multiple regulations under the Registrar of Cooperative Societies. This will allow them to work as free and autonomous entities in the competitive market.

Investments in Value Addition

An increase in yields that expands scale in production, and facilities of aggregation that expand scale post-production are necessary conditions for the growth of agribusiness via processing and value addition. Typically, if we desire large investments in processing and value addition, we must create raw material supplies at scale, and at viable costs, to these units.

Status of food processing

There were 7,592 food and agricultural processing "factories" in Kerala in 2022-23, as per the Annual Survey of Industries (ASI). Of these, there were 2,926 factories, constituting about 39 per cent, that were directly or indirectly related to agriculture. The share of factories connected with agriculture had marginally fallen in 2022-23 compared to 2011-12 but they still constituted more than one-third the total numbers of factories. These units were involved in a variety of operations but most of them – about 22 per cent of the 39 per cent – were engaged in the manufacture of food products in 2022-23. The number of factories in the manufacture of food products rose from 1,516 in 2015-16 to 1,644 in 2022-23.

Table 13.4 *Number of factories in manufacturing of food products and rubber products, by 3-digit NIC, ASI, Kerala, 2011-12 to 2022-23* in number and per cent

Industrial classification (NIC, 2008)	Number of factories		
	2011-12	2015-16	2022-23
Manufacture of miscellaneous food products	907	977	1,049
Processing and preserving of fish, crustaceans and molluscs and products	119	154	157
Manufacture of grain mill products, starches and starch products	153	171	162
Manufacture of dairy products	75	76	96
Manufacture of vegetable oils and animal oils and fats	69	60	87
Processing and preserving of fruit and vegetables	49	62	50
Manufacture of prepared animal feeds	15	14	38
Processing and preserving of meat	3	3	5
Total: manufacture of food products	1,387	1,516	1,644
Manufacture of rubber products	367	364	339

Source: Annual Survey of Industries, various rounds

Using 3-digit classifications, we can disaggregate the factories in the manufacture of food products into various sub-categories (see Table 13.4). First, about 64 per cent of these 1,644 factories were involved in the "manufacture of miscellaneous food products" that includes a range of products. The two other important sub-categories in 2022-23 were grain mills and fish processing firms (both constituting about 10 per cent each). The remaining factories were those in the manufacturing of dairy products, vegetable oils (i.e., oil mills), and animal feeds and those involved in fruit processing and meat processing. The two relatively large sub-categories that expanded their footprint over the last decade were fish processing firms and oil mills.

The factories in "manufacture of food products" alone generated a gross value of output worth Rs 35,936 crore in 2022-23. This formed a major increase from the corresponding figure of Rs 17,966 crore in 2011-12. However, factories in "manufacture of miscellaneous food products" contributed only about 38 per cent of the gross value of output in 2022-23. If factories in fish processing constituted only about 10 per cent of the number of factories, they contributed about 22 per cent to the gross value of output. Similarly, if factories in the manufacture of dairy products constituted only about 6 per cent of the number of factories, they contributed about 13 per cent of the gross value of output.

In 2022-23, factories involved in the "manufacture of food products" engaged a total of 86,804 persons in various capacities. The number of persons engaged in the manufacture of miscellaneous food products was the highest at 54,320. Strikingly, the gross value of output per person in the "manufacture of food products" rose substantially over the years– from Rs 9,95,862 in 2011-12 to Rs 29,28,590 in 2015-16 to Rs 41,39,913 in 2022-23 (Figure 13.12). In short, one

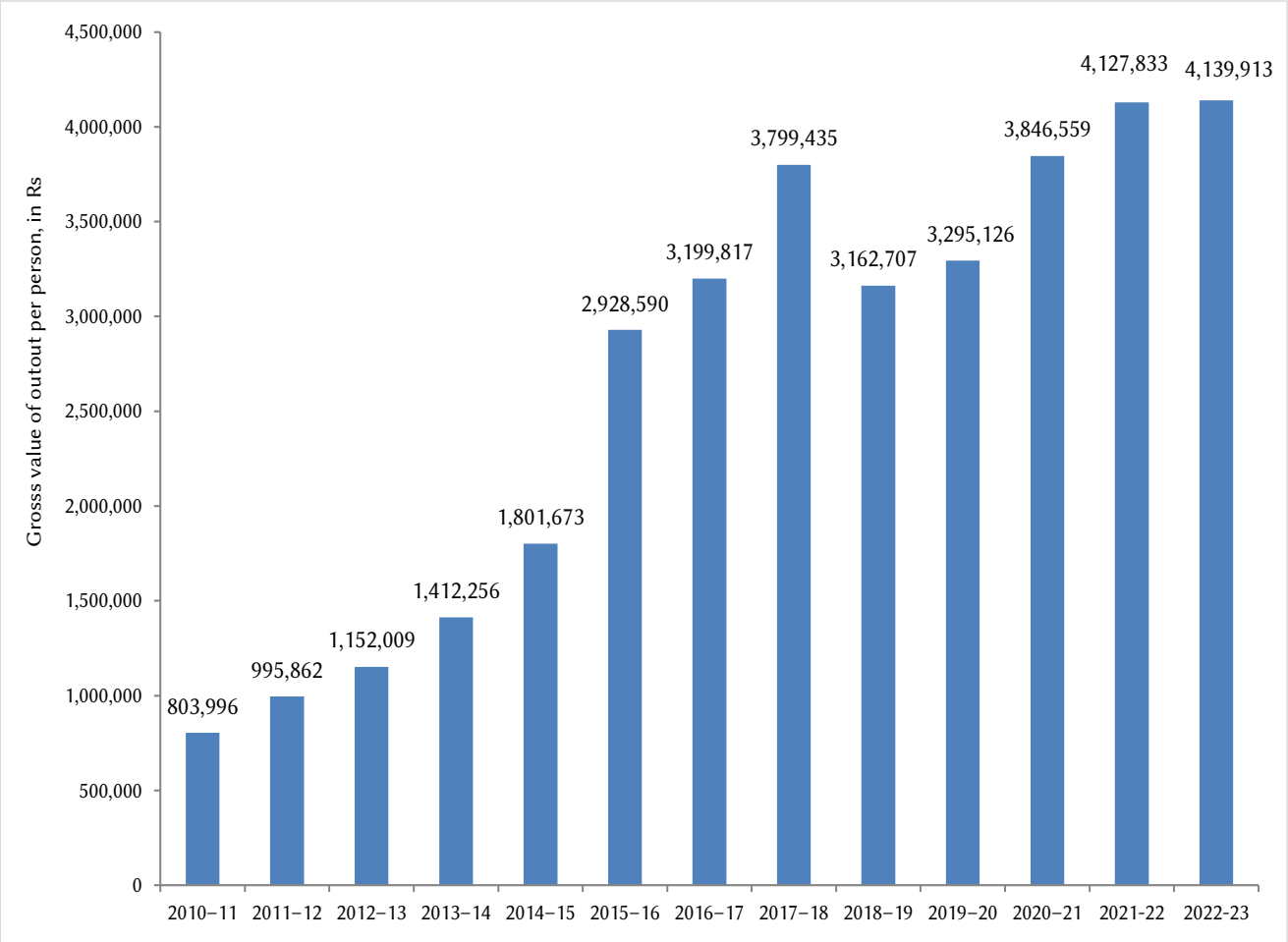


Figure 13.12 *Gross value of output per person, factories in manufacturing of food products, ASI, Kerala, 2011-12 to 2022-23* in Rs

Source: Annual Survey of Industries, various rounds

person generated an average gross value of output about Rs 41 lakh a year in these factories. The rise in the gross value of output per person was also an indication of the increasing adoption of labour-saving technologies in food processing. This was evident from rise in the capital-labour ratios in these sectors over the various ASI rounds.

The Department of Industries publishes another set of data. Around 2,500 units in agriculture registered every year till 2019-20, the number began to rise significantly afterwards. In the three years between 2022-23 and 2024-25, a total of 23,637 manufacturing units in agriculture registered with the Department. This implied that the average number of manufacturing units in agriculture registered every year was 7,879.

These figures show that the agricultural processing sector in Kerala is not a small sector. At the same time, it has the potential to further expand by a multiple, given the range of crops grown in the State with a wide variety of products and by-products.

Completed and outstanding reforms

Typically, attracting private investment in food and agricultural processing requires five important prerequisites: availability of aggregated raw materials in scale; assurance of uniform grading and quality parameters in the supply of raw materials; ease of investment and doing business; a facilitating legal environment; and the presence of investment sites with adequate infrastructure and other facilities. We discuss the last three here.

Ease of doing agribusiness. Presently, the stakeholders involved in the processes are the Kerala State Industrial Development Corporation (KSIDC), Kerala Industrial Infrastructure Development Corporation (KINFRA), Small Farmers Agribusiness Consortium (SFAC), Incubation centres of the Kerala Agricultural University (KAU), the Kerala Startup Mission (KSUM), NABARD and the LSGs at various tiers.

KSIDC has undertaken several measures by amending the rules and laws that govern the setting up of businesses, labour relations and interfacing with LSGs. For example, the Kerala Investment Promotion and Facilitation Act, 2018 amended 7 acts and 10 rules by eliminating redundant regulations, simplifying clearance procedures, reducing timelines, and increasing the duration of clearances, and establishing standard operating procedures and investment promotion and facilitation cells.

The SFAC supports Farmer Producer Organisations (FPO) to engage in the entire value chain related to agriculture and allied products i.e., in production, aggregation, storage, processing, marketing, and export. The incubation centres in the KAU act as forums or venues to bring entrepreneurs together and collectively address and discuss problems and opportunities. There are several difficulties that investors in agri-business, startup founders and other entrepreneurs face in Kerala. While many the reforms have been undertaken to simplify the processes involved in these spheres, more needs to be done. The complex regulatory environment, inadequate concessions on utility charges and credit constraints rank at the top. In addition, constraints have also been noted related to lack of access to information about setting up an enterprise, and assistance on demand profile, market potential, technical feasibility, availability of required technology, machinery, equipment, skilled labour, and raw materials.

Broadly, the reforms must transform the ecosystem of entrepreneurship.

- The licensing rules must be increasingly hassle-free.
- While website-based communication is largely one-way, offices like the DIC must have a constant two-way communication mechanism with entrepreneurs.
- There should be and increase in the number of agripreneurship guidance centres in each District, which are best established and operated by the LSGs.
- One institution in the State may be designated as the State Lead Agency for the network of incubation centres in agriculture. This agency could function as the single nodal point for all enquiries related to the requirements for incubation facilities or minor processing of agricultural products. They could provide mentoring services for prospective entrepreneurs, link them with financing bodies and marketing consultants, identify new areas of investment based on emerging trends and market needs, and be the point of assimilation for new ideas and innovations from entrepreneurs.
- To improve the access to finance, the Government must engage with the State-level Bankers Committee (SLBC) to review the financing guidelines and check the inertia to lend to the MSMEs.
- While subsidies to promote entrepreneurship and new businesses continue to be important, reforms

Box 13.2
Study Report on the Natural Rubber Sector

The Kerala State Planning Board constituted an Expert Group to examine the market dynamics and price determination mechanisms for Natural Rubber (NR) in Kerala, recognising the persistent challenges faced by NR smallholders.

The Study Group advanced several key recommendations. First, the Government must address cartelisation and market distortions in the rubber sector. It should initiate a formal investigation under the Competition Act, 2002, and actively involve organisations like the Kisan Sabha and Rubber Producers Associations to represent smallholders

Secondly, the Group called for reforms in trade and sectoral policies. With India being a trade deficit country, large-scale NR imports undermine national economic interests and jeopardise the livelihoods of domestic smallholders. The Government of Kerala should engage proactively with the Ministry of Commerce to highlight these issues.

Thirdly, the current Rubber Price Incentive scheme, though critical, is deemed insufficient as base price support lags behind actual production costs. The Study Group recommends redesigning the now-defunct Price Stabilisation Fund Scheme, previously run by NABARD, into an exclusive, well-funded programme for the NR sector.

The report also emphasises the adoption of international best practices for price stabilisation, drawing lessons from the UNCTAD-led Integrated Programme for Commodities and similar global schemes. These models employ market interventions and buffer stock creation to establish a cap-and-collar price system. In India, such mechanisms would require active participation from manufacturers, Government, and the Rubber Board, with dedicated contributions to a price stabilisation fund.

Concerns about the transparency and operational efficacy of the Rubber Board are highlighted, with recommendations for professional reviews of daily price declarations and full implementation of parliamentary committee guidelines on information disclosure. The introduction of GST has eliminated direct revenue from rubber cess, making it crucial to financially strengthen the Rubber Board. Additionally, the proposed new Rubber Bill is criticised for curtailing the Board's functions and reducing state representation.

Finally, the report underscores the importance of productivity, research, and technology. Kerala, historically a leader in rubber yield productivity, risks losing its edge due to underfunded research institutions. Enhanced investment is deemed essential, especially in light of climate change and opportunities presented by biotechnology and automation.

The future viability of NR in Kerala rests on addressing land use constraints, encouraging diversification, and ensuring robust support systems for remunerative pricing. Kerala's continued leadership in NR is essential for India's self-sufficiency, but this requires proactive policy, institutional, and technological interventions.

may be undertaken to link these subsidies with production or credit.

- The promotion of venture capital mode of investment in the food processing sector must be considered and implemented.
- The entrepreneurship schemes of the Government of India may be better linked with State-level efforts for cluster development, capacity building, funding, branding, and marketing support.
- The concept of traceability must be popularised by the Government and detailed traceability guidelines may be formulated to help various stakeholders in agribusiness.
- There must be an expansion of the quality testing facilities for farmers, food processing units, and exporters.
- The rules and procedures for the purchase of chemicals, such as alcohol, for industrial use needs to be relaxed.

- e-platforms for logistics and supply chain management are underdeveloped currently. There must be the development of such a unified platform for agricultural products in the State.
- The multitude of research and educational institutions must come together on a single platform to work with entrepreneurs to continuously upgrade their technologies.
- The syllabus followed in courses under the KAU may be reoriented to ensure that the university emerges as a good generation point for agripreneurship.

A District-level monitoring and evaluation of the progress in the above reforms must be undertaken regularly. One could construct a monthly Kerala Agripreneurship Scoreboard at the State and District levels, which would include the tasks and outcomes.

Legal reforms. Legal reforms also need to be undertaken for the promotion of agribusiness in the State. The first relates to licensing requirements for wines produced from fruits. Kerala needs to develop a Fruit Wine Policy that would streamline regulations, reduce taxes, and encourage small-scale producers. As fruit wines are classified under Indian Made Foreign Liqour (IMFL) or beer or toddy, the regulatory environment is extraordinarily stifled. Kerala requires a unique definition of fruit wine, especially for those with lower alcohol content. There must be amendments to the Kerala Abkari Act and excise laws towards this

Box 13.3
Study on Diversification and Modernisation of the Plantation Sector

The study report titled "Diversification and Modernisation of the Plantation Sector in Kerala", prepared by IIM Kozhikode in collaboration with the Directorate of Plantation, provides a comprehensive analysis of the current challenges and future prospects of Kerala's plantation sector. The report identifies that the fundamental issue plaguing plantations is not their inherent unviability, but rather diminishing profitability and increasing economic risk. This decline has made the sector more vulnerable and less capable of making the investments required for scaling and modernisation. As a result, plantation players have become price takers, unable to influence market prices due to weak market linkages, limited operational scale, and a failure to move up the value chain or leverage distinctiveness. The lack of coordinated efforts in brand building and resource pooling has further eroded competitive advantage.

A significant barrier to the sector's progress is the outdated legal framework, , and the report emphasises the urgent need for a paradigm shift in the administrative approach governing plantations.

Labour welfare stands out as a core concern, given Kerala's reputation as a model State for labour rights. The report warns that the current economic and regulatory pressures threaten job security and welfare standards. It advocates for a holistic approach to revitalising the sector that simultaneously safeguards labour interests. One recommendation is to extend social security schemes such as the Employees' State Insurance (ESI) to plantation workers, ensuring continued welfare and prosperity.

Ecological preservation and conservation are highlighted as central to the sector's sustainability. The study calls for policies and practices that promote biodiversity and mitigate environmental impacts, recognising that ecological health is inseparable from economic vitality.

Kerala possesses natural advantages that can be harnessed to reclaim competitiveness not only in traditional plantation crops but also in emerging sectors such as tropical and exotic fruits. Achieving this vision requires a thorough review and overhaul of existing policies and operational frameworks, aligning them with the realities of the contemporary economic and social landscape.

The report offers a roadmap for the transformation of Kerala's plantation sector, centred on profitability, regulatory reform, labour welfare, ecological conservation, and strategic diversification. It calls for collective action and administrative reform, positioning Kerala to leverage its strengths and adapt to future opportunities while ensuring the welfare of its workforce and the sustainability of its natural resources.

purpose, which must introduce separate licensing procedures for fruit wine production. Alongside, a lower tax slab structure – like the one for grape wine in Maharashtra – will be immensely helpful. These reforms could facilitate the production of fruit wine in FPOs, MSMEs, and SHGs in addition to larger industrial units in the organised sector. Encouragement could also be provided to tribal communities to produce wines from wild fruits. The quality of fruit wines can be improved in collaboration with institutions like the KAU.

The example of neera from coconut may be a case in point. Indeed, the failure of expectations in the production and processing of neera must be reviewed from the point of view of technology and marketing. The marketing of neera must focus on targeted consumers, their preferences, and competing products. Excise laws must also be reviewed.

Sites of investment. The development of industrial parks and food parks are an important instrument to attract private investment in agricultural processing and value addition. Over the years, significant achievements have been attained in this sphere.

For instance, the Kerala Rubber Limited (KRL) was formed by Government of Kerala in June 2019 to establish world-class infrastructure that enhances value addition in natural rubber through public-private partnerships. The aim is to create a stable market for natural rubber, ensuring consistent returns for growers, and contributing to Kerala's economic development. Main benefits expected from the project are: improve marketability and value addition of natural rubber and thereby improve returns to growers with focus on Rubber Producers Societies (RPS) and other farmer groups; to supply high quality rubber products destined for domestic and international markets; make the State a hub for rubber-based industries by the establishment of natural rubber-based manufacturing industries in Kerala; and generate employment opportunities for economic advancement of the State. About 157 acres of land is earmarked for KRL in the premises of Kerala Paper Products limited (KPPL). KRL will be equipped to provide services through its promotional activities/ infrastructure facilities to nature rubber-based and allied industries in the State and elsewhere. The Industrial Complex is expected to generate around 3,000 direct and 5,000 indirect employment opportunities through establishment of natural rubber-based and allied industries by entrepreneurs.

Kerala Industrial Infrastructure Development Corporation (KINFRA) has created industrial and food parks which are well utilised. There are 43 units in agriculture across the 9 Industrial parks; 6 Food Parks, collectively covering over 200 acres; and 7 the crop-specific parks in progress for spices, rice, coconut, coffee, and rubber.

Given the strong demand for spaces in these parks, the Government must make available sufficient land to set up more parks for units at the micro, small, and medium industry levels. There must be at least 300 acres of industrial land in the form of estates and parks available at any point of time and spread across all regions of the State. Where necessary, given the scarcity of land and the high land price in Kerala, vertical expansion of infrastructure rather than a horizontal expansion must be explored.

Existing structures and mechanisms within the Government regarding establishing investment parks must be regularly reviewed, keeping in mind the changing requirements of the investing community. One important area where more discussions are required is the land pricing policy in the parks.

The land pricing policy followed by KINFRA is based on a detailed methodology and attendant guidelines for fixing the lease premium.

As KINFRA simply its procedure to recover its cost, alongside development and administrative charges, many entrepreneurs perceive the land cost and premiums to be unbearably high. It may be important for the government to consider a new subsidy policy on land use in industrial and food parks to make it more viable for small entrepreneurs to enter these parks.

Summary

This chapter examined both progress and challenges in agriculture.

Recommendations that emerge emphasise the need for dynamic public policies tailored to the scale and sectoral focus of new ventures, enhanced inter-agency coordination, and transparent communication channels between stakeholders. There is a clear consensus that long-term competitiveness will depend not only on physical infrastructure, but on the creation of an enabling environment that attracts and retains human power, capital, and innovation.

The chapter provides a roadmap for inclusive agricultural and agro-industrial development, urging sustained policy attention to the evolving needs of all participants.

Animal Resources in Kerala

The animal husbandry and dairy sectors in Kerala hold enormous promise, and can become key drivers of overall agricultural growth in the next decade. The sector was subject to considerable stresses in the last decade arising from restrictions on cattle trade and a sharp rise in feed prices. Public policy had to focus not just on growth-oriented strategies but also on interventions that provided economic relief to producers. Kerala was able to increase the production of milk, meat, and eggs through policies and plans that promoted the cooperative sector, leveraged public-sector initiatives, and facilitated higher levels of private investment. At the same time, policy measures also shielded growers from vagaries of the market by providing the highest prices for milk in the country and making feed available at subsidised prices. The strategies followed in the sector have created favourable conditions for further growth based on scale-enhancement and higher productivity.

The animal husbandry sector is a vital pillar of Kerala's agrarian economy, offering livelihood security to millions and contributing significantly to food and nutritional needs. The 20th Livestock Census in 2019 reported the State's livestock population as 29.1 lakh, with 13.4 lakh cattle, 13.6 lakh goats, 1 lakh pigs, 0.9 lakh rabbits, and 289.4 lakh poultry. Unlike other Indian States, Kerala's livestock production is intensive, based on smallholder, homestead, and cooperative models. The convergence of high human development indices, gender-inclusive cooperatives, and a strong scientific base create an enabling environment for progressive livestock development in Kerala.

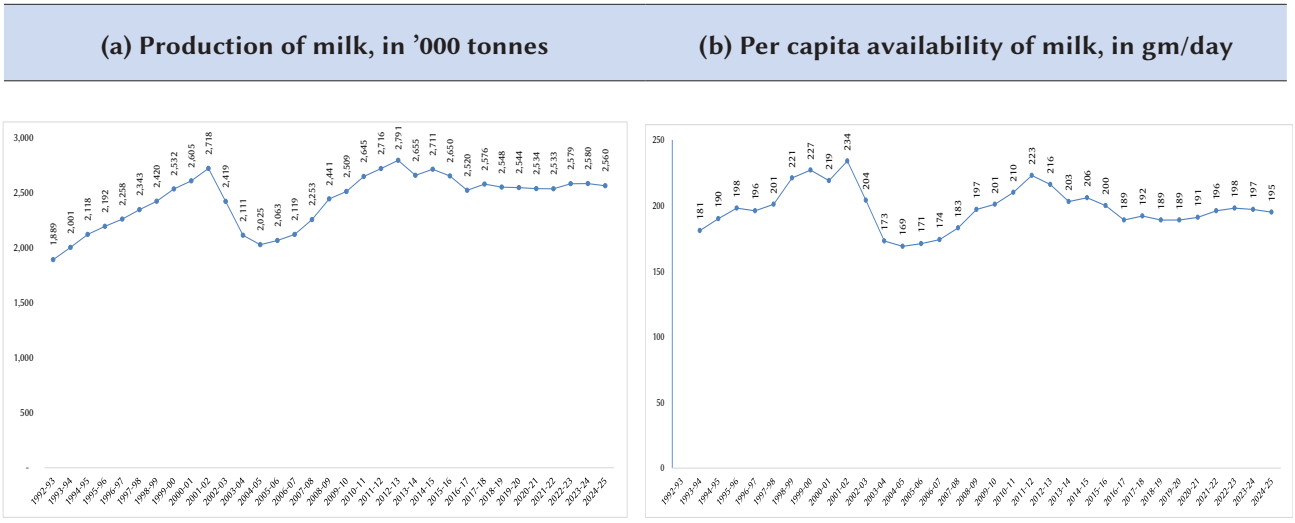
Changes in the Livestock Economy

Trends in production

In India, the contribution of the livestock sector to the gross value of output in agriculture and allied sectors, in constant prices, increased from 25.6 per cent in 2011-12 to 30.7 per cent in 2023-24. In Kerala the corresponding contribution increased marginally, i.e. from 23.4 per cent in 2011-12 to 24.2 per cent in 2024-25. Kerala Development Report 2021 had undertaken a detailed analysis of the long-term decline of milk production in Kerala after 2012-13. This decline was owing to several reasons, including the incidence of the foot-and-mouth disease among cattle in 2013-14, and a severe drought in 2016-17. In milk, the total production declined from 27.9 lakh tonnes in 2012-13 to 25.2 lakh tonnes in 2016-17. There were efforts during the 13th Plan period to arrest this decline. However, these efforts were set back by the two floods of 2018 and 2019, as well as the Covid-19 pandemic in 2020 and 2021. Regardless of these adversities which had a longer spillover period, milk production rose over the 14th Plan period from 25.3 lakh tonnes in 2020-21 to 25.6 lakh tonnes in 2024-25 (Figure 13.13(a)). Revival was also visible in the per capita availability of milk, which increased from 189 grams per day in 2016-17 to 195 grams per day in 2024-25 (Figure 13.13(b)).

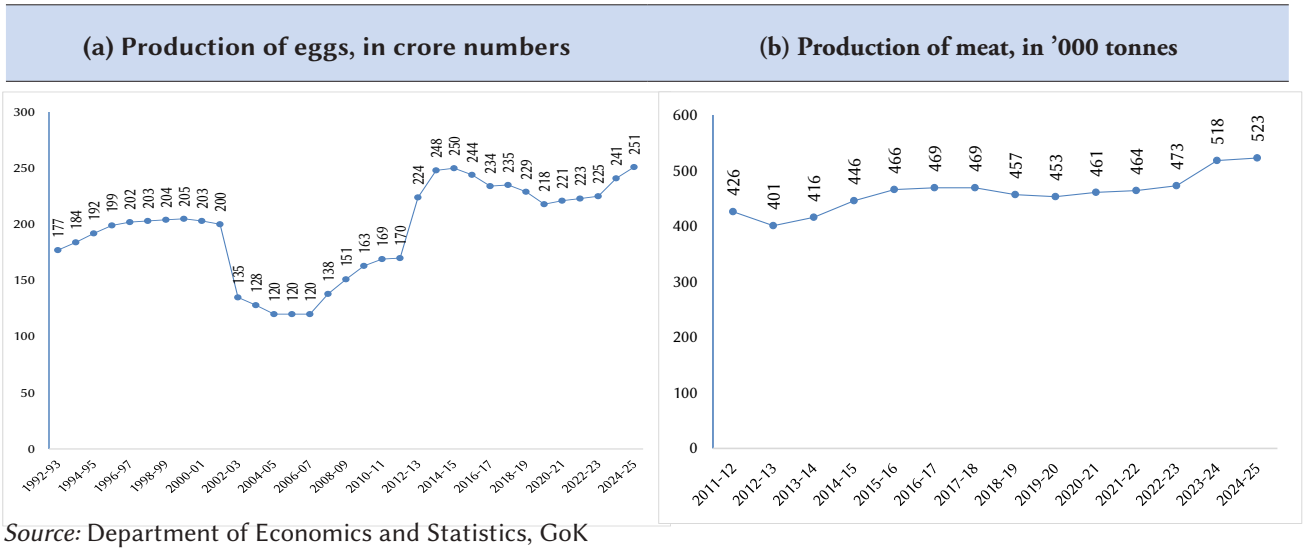
There was a similar decline in the production of eggs between 2014-15 and 2019-20 (Figure 13.14).

Figure 13.13 *Production and availability of milk in Kerala, 1992-93 to 2024-25* in '000 tonnes and grams per day



Source: Department of Economics and Statistics, GoK

Figure 13.14 *Production of eggs and meat, Kerala, 1992-93 to 2024-25* in crore and '000 tonnes



Source: Department of Economics and Statistics, GoK

This decline, as in the case of milk, was owing to various disease outbreaks and the two floods of 2018 and 2019. But egg production picked up over the 14th Plan period from 218 crore in 2019-20 to 251 crore in 2024-25. In the case of meat, total production was stagnant for a prolonged period but increased from 4.6 lakh tonnes in 2020-21 to 5.2 lakh tonnes in 2024-25.

Government Support and Initiatives

Herd induction

An important contributor to the sustenance and increase of milk production was the herd induction scheme of the State Government. Cumulatively, the Government distributed 68,697 milch animals and 17,976 heifers to farmers between 2011-12 and 2024-25. The number of milch animals and heifers distributed more than doubled over the 13th and 14th Plan periods: the combined cumulative number of these animals distributed (after 2011-12) increased from 40,258 in 2016-17 to 86,673 in 2024-25.Though the distribution of animals slowed down during the latter part of the 14th Plan, the overall impact of the scheme on milk production was still significant.

To ensure the availability of heifers in Kerala for further distribution, the Government also established heifer parks from 2018-19. These parks are designed to adopt and nurture around 100 heifers each.

Milk procurement

A second important contribution came from the expansion of milk procurement under the State's dairy cooperative network. A signal achievement of the Government was the significant increase in annual procurement of milk during the later years of the 13th Plan and the early years of the 14th Plan, which coincided with the Covid-19 pandemic. During the pandemic, dairy cooperative societies jacked up their annual procurement to nearly 8 lakh Metric Tonnes. The daily procurement of milk crossed 21 lakh litres per day, which was a historic high. There was a slowdown in procurement after 2023-24, but the absolute figures in 2024-25 (6,186.2 lakh litres per year, 16.9 lakh litres per day) remained higher than the corresponding figures in 2015-16 (5,971 LLPY, 16.4 LLPD).

Kerala's dairy policy also ensures that dairy farmers receive the highest price in India for milk procured through cooperatives. The prices received by dairy farmers vary across States depending on the various combinations of fat content and solids-not-fat (SNF) content. In 2025, the prices paid per litre to dairy farmers for these different combinations of cow milk ranged between Rs 40 to Rs 45 by the Gujarat Cooperative Milk Marketing Federation; Rs 35 to Rs 40 by the Maharashtra State Cooperative Milk Federation (under the Mahanand brand); Rs 37 to Rs 42 by the Karnataka Milk Federation; and Rs 35 to Rs 40 by the Tamil Nadu Cooperative Milk Producers' Federation (under the Aavin brand). Cow milk procurement prices were in the range of Rs 35 to Rs 45 per litre, and procurement prices of buffalo milk were slightly higher.

The prices paid by the Kerala Cooperative Milk Marketing Federation (KCMMF) to dairy farmers were the highest in any State in 2025-26. Across various combinations of fat content and SNF content, the price paid by KCMMF to dairy farmers were in the range of Rs 38 to Rs 47 per litre (see Table 13.5 for

Table 13.5 *Milk prices paid by selected dairies to farmers in various States, by selected combinations of fat and SNF, India, 2025-26* in Rs per litre

Fat (%)	SNF (%)	Organisation/brand	Price paid by dairy to farmers (Rs per L)
3.0	8.1	KCMMF/MILMA	38.64
		TCMPFL/AAVIN	29.80
		KMF/Nandini	Not notified
		TSDDCF/Vijaya	Not notified
		IDMP/Sonai	28.30
3.0	8.5	KCMMF/MILMA	40.04
		TCMPFL/AAVIN	30.95
		KMF/Nandini	Not notified
		TSDDCF/Vijaya	Not notified
		IDMP/Sonai	29.50
4.2	8.3	KCMMF/MILMA	43.52
		TCMPFL/AAVIN	33.75
		KMF/Nandini	Not notified
		TSDDCF/Vijaya	36.49
		IDMP/Sonai	32.80
4.5	8.5	KCMMF/MILMA	45.26
		TCMPFL/AAVIN	35.21
		KMF/Nandini	36.49
		TSDDCF/Vijaya	38.63
		IDMP/Sonai	34.00
4.8	8.6	KCMMF/MILMA	46.65
		TCMPFL/AAVIN	36.42
		KMF/Nandini	37.46
		TSDDCF/Vijaya	40.03
		IDMP/Sonai	34.70

Source: Compiled from various dairies

Note: (a) KCMMF: Kerala Co-operative Milk Marketing Federation; TCMPFL: Tamil Nadu Cooperative Milk Producers' Federation Limited; KMF: Karnataka Milk Federation; TSDDCF: Telangana State Dairy Development Cooperative Federation Limited; IDMP: Indapur Dairy and Milk Products Ltd, Maharashtra (private dairy).

(b) For KMF, the chart begins from 4.0/8.5 only, for which the cited price is Rs 35.30 per litre. For TSDDCF, the chart begins from 3.20/8.30 only, for which the cited price is Rs 32.69 per litre.

(c) For KCMMF, the payment is based at Rs 366.52 per kg of total solids.

a comparative analysis). In addition to a high price, LSGs in Kerala pay an additional milk incentive of Rs 3 per litre to dairy farmers, regardless of the quality, subject to a ceiling of Rs 40,000 per dairy farmer per year.These milk incentive payouts were substantial every year. For example, LSGs distributed Rs 110 crore as milk incentive to the dairy farmers in 2024-25. The broad policy of the State Government is also that whenever the retail prices of milk are increased by Rs 1 per litre, dairy farmers in Kerala must receive 84 paisa.

To regulate milk prices and price volatility better, the State Government financed the construction of a new milk powder factory in Murkkanad, Malappuram. The commissioning of this factory, with the total capacity of 10 MT, which will ensure that liquid milk produced in Kerala will not be needed to be transported to other States for conversion to milk powder. It is notable that nearly 1.2 to 1.3 lakh litres of milk are transported every day to neighbouring States for conversion to powder from Kerala.

Modernisation of dairy cooperatives has been an ongoing policy agenda. There are about 3,500 dairy cooperatives in Kerala. Between 2016-17 and 2024-25, about 170 new dairy cooperative societies were registered and 121 dairy cooperative societies were rejuvenated through technical and financial assistance. Another 100 dairy cooperative societies are being readied either for first-time registration or for rejuvenation in 2025-26. Financial assistance was also offered to the struggling dairy cooperative societies through a new scheme. Here, about 400 struggling societies procuring less than 250 litres of milk per day were identified and provided with an annual managerial subsidy.

For the first time, the functioning of all dairy cooperative societies is now online based on a web portal Ksheerashree. Unified software has also been introduced for this purpose, which records the quantity, quality, and prices in each society. It was commendable that this portal received the silver medal in the Digital India Award category from the Government of India in 2022, as well as various e-governance awards instituted by the Government of Kerala.

24/7 mobile services

There were multiple other schemes of the State Government that directly and indirectly increased support for milk production over the 13th and 14th Plan periods, particularly in disease prevention and extension. For example, the concept of mobile veterinary clinics and 24-hour veterinary services were introduced during the 13th Plan and expanded to 228 such services across all 152 Blocks of the State during the 14th Plan. Each mobile veterinary unit includes a doctor, staff, and essential medical equipment. Its services are booked by dairy farmers through a 24/7 centralised call centre via the toll-free number 1962. Both these services have ensured timely and efficient medical care for both livestock and domestic animals.

The mobile veterinary units are aimed at providing specialised services to dairy and livestock farmers, which includes diagnosis services, vaccinations, minor surgical interventions, audio-visual aids, artificial insemination, and extension services at the doorstep. They also help generate current information regarding animal health in the remote villages. The centralised call centre receives calls from farmers, prioritises them based on the nature of the emergency and transfers the case to the nearest mobile veterinary unit. Surgeries, including sterilisation of domestic animals, are performed at Government-approved rates. To ensure adequate staff for these services, the Government has appointed freshly graduated veterinary doctors as Junior Resident Veterinary Doctors in about 60 animal healthcare centres.

In these mobile units, farmers also receive medicines at a uniform and affordable service rates. To provide treatment at the doorstep for cattle or poultry, there is an additional charge of Rs 450. To provide artificial insemination, there is an additional charge of Rs 50. The fee for treating feral animals at the doorstep is Rs 950. In all, 59 mobile units were operational in the State in 2024-25. This apart, to strengthen the doctor base in clinics, a new scheme was introduced to appoint fresh veterinary graduates as Junior Resident Veterinary Doctors. In 2021-22 and 2022-23, there were 101 such appointments across the State.

Laboratory infrastructure has also been significantly upgraded to enhance disease diagnosis capabilities. Key laboratories, such as the State Institute for Animal Diseases (SIAD), the Avian Disease Lab in Thiruvalla, the District Lab in Palakkad, and the Livestock Marine and Agri-Products Lab in Maradu, now operate with NABL accreditation.

Comprehensive Cattle Insurance Schemes

Kerala implemented comprehensive cattle insurance schemes under both State Plans and centrally supported programmes from 2016-17. To streamline its operations, reduce administrative complexities and provide uniform benefits, a new cattle insurance scheme

was introduced by integrating the multiple insurance components previously implemented under the Union Government's NLM (National Livestock Mission) and the State Government's Gosamrudhi schemes. This scheme covered the death of the animal (due to accident, natural calamities, or disease) and permanent total disablement (due to disease/infertility /accident) of the animal.

As cattle insurance schemes in the State were developed in alignment with the NLM, the structure and guidelines have changed over the years. As per the latest guidelines issued by the Government of India in March 2024, farmers contribute only 15 per cent of the premium. The remaining 85 per cent of the premium is paid by the Union and State Governments on a 60:40 basis. The number of animals insured under the State scheme (24,580) has been higher than under the Union scheme (15,784). The monetary expenditures have also been higher at the State-level, as the State Government has also been funding the Gosamrudhi scheme independently in addition to paying the State share of the central scheme.

In addition, the Malabar Regional Cooperative Milk Producers' Union initiated a separate scheme in 2023 titled Saral Krishi Bima Yojana, which is a parametric heat index-based cattle insurance scheme. This scheme helps farmers hedge against losses suffered due to adverse weather incidences, such as temperature, rainfall, and relative humidity. Normally, milk production declines when temperatures rise in the summer months. The daily maximum temperature is assessed vide the Indian Meteorological Department's Satellite Based Gridded Data at the Taluk level. The temperature reading for 30 days in April and May would be monitored, and the claims would be paid based on the deviations in prefixed temperature triggers specific for each District.

The scheme is fully operational in six Districts-, Palakkad, Malappuram, Wayanad, Kozhikode, Kannur, and Kasaragod. It is also partially operational in Thiruvananthapuram and Ernakulam. The premium rate is Rs 170 per cow or buffalo. Of this, Rs 100 is the share of the Union and Rs 70 is the beneficiary share. The maximum sum insured per cattle is Rs 2,000 and the premium ranges from 4 per cent to 5 per cent. About 15,000 cattle are insured under this scheme, where one farmer will get a maximum amount of Rs 1,000 at the rate Rs 100 per cow as regional union subsidy.

The Kerala Chicken project

While an increase in meat production and egg production is largely driven by private capital and entrepreneurs, the State Government designed an innovative scheme to demonstrate a model and create an enabling atmosphere. The objective was also to control the prices of broiler meat, which was largely controlled by large corporate players. This scheme, called Kerala Chicken, was announced in 2017-18 and continues to be a flagship scheme in the sector.

The Kerala Chicken project was aimed at transforming the State's poultry sector through a community-driven, women-led model. The project was an attempt to ensure the production and supply of high-quality, safe, wholesome broiler chicken at a reasonable price to consumers under the label of Kerala Chicken, and develop this sector as a viable livelihood vocation for farmers. The stakeholders were the Kerala State Poultry Development Corporation (KSPDC), Kudumbashree, and the Animal Husbandry Department. The project is operational in 11 Districts: Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha, Kottayam, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikode, and Kannur.

The Kerala Chicken project was a significant step towards creating an organised, scalable, and sustainable poultry value chain. Poultry meat is marketed through two primary channels: live outlet sales and processed frozen sales. Kerala Chicken markets hygienically processed and frozen chicken products under its brand name with a distinctive packaging to cater to modern retail demands through supermarkets, hypermarkets, and departmental stores. The brand Kudumbashree Kerala Chicken alone had sales revenue of Rs 105 crore in 2024-25. Here, the entire supply chain from the farm till the retail sale point is coordinated by the Kudumbashree Broiler Farmers' Producer Company Ltd., with strong institutional support from its own area development societies (ADS), community development societies (CDS), and the Kudumbashree District and State missions. The company ensures a fully integrated production model by supplying day-old chick, feed, veterinary medicines, and continuous technical support to farmers. In 2024-25, an average farmer was provided with a rearing fee of up to Rs 13 per kg, which was disbursed within 15 days of bird lifting.

Beyond strengthening the poultry sector, the project aimed at promoting women's economic empowerment. Over the years, the project created sustainable livelihood opportunities and promoted entrepreneurship, enabling women to take ownership of their poultry ventures. This not only fostered economic independence but also enhanced their social status and cultivated leadership at

the grassroots level. According to internal estimates of the Kudumbashree Mission in 2024-25, women who ran retail outlets earned an average of Rs 1,00,000 per month from sales, while women poultry farmers had a gross earning of up to Rs 2,60,000 every 45 days.

The Kerala Chicken project has been ably facilitated by new infrastructural initiatives in the poultry sector by various public agencies. The KSPDC established a Broiler Breeding Farm and Hatchery in Kudappanakunnu, Thiruvananthapuram that is equipped to rear up to 25,000 broiler parent birds at lay, with an annual production capacity of 56 lakh day-old broiler chick. Out of the 100 Broiler Rearing Farms allotted to the KSPDC, 20 units have been completed. Also, 53 out of the 800 units allotted to Kudumbasree and all the 43 units allotted to the Brahmagiri Development Society have been completed. The KSPDC was also able to purchase a reefer van under the project. Similarly, the Layer Breeding Farm and Hatchery in Kottiyam, Kollam has increased the annual capacity to generate 10 lakh day-old layer chick. A state-of-the-art broiler processing plant and pet food manufacturing unit has been established at Kottukal, Kollam. The Meat Products of India (MPI) too established a modern value-added meat processing plant in Yeroor, Kollam. The MPI also received food safety management systems certification for the export of buffalo and pork meat.

Kerala has a daily chicken consumption of approximately 2,000 MT, but domestic production is limited to about 700 MT only. Of this domestic production, the Kudumbashree initiative currently contributes about 58 MT. While the quantity is presently small in absolute terms, it could be effectively used to regulate chicken prices. It also shows the future potential of the project when it is upscaled.

Ease of doing livestock

The Kerala Development Report 2021 made a persuasive case to relax laws and regulations that prevented the attainment of scale and efficiency in livestock production in Kerala. It was noted that most livestock units in Kerala were small, as defined by herd sizes. This feature hindered the growth of rural entrepreneurship and highlighted the need to popularise the establishment of larger, commercially-run livestock farms. A major hurdle in such an expansion of size was the legal structure, which disincentivised potential investors. The presence of more than five cattle, more than five pigs or more than 20 goats classified the unit as "hazardous" under the 2012 rules of the Kerala Panchayati Raj Act. There were also many allegations of harassment of livestock farm owners on issues related to the implementation of the regulations of pollution control in dairy farms, especially those equipped with Bulk Milk Chilling Centres (BMCC).

Noteworthy progress was achieved over the 14th Plan period in undertaking these reforms. Amendments were initiated in the livestock licensing rules to encourage commercial livestock, particularly dairy, farming on a larger scale. The following changes were undertaken.

- Livestock farming will no more be considered an activity that causes "intolerance" in society and has been scientifically defined as an "economic activity" that requires the mandatory approval/licence of the Panchayat/Municipal Secretary.
- All business applications submitted to the Panchayat Secretary in Form 1 must now be processed within 14 days, and license issued in Form 2. The license will be valid for a minimum of 1 year and a maximum of 5 years. No NOC would be mandatory from the District Medical Officer or the District Pollution Control Board.
- The number of animals that would necessitate a license from the Panchayat Secretary has been increased from 5 to 10 in cattle; 20 to 50 in goats; 25 to 50 in rabbits; and 100 to 500 birds in poultry. The classification of farms into classes will also be redefined appropriately.
- A matured animal would be redefined as one above 18 months in cows and buffaloes; above one year in goats; above 6 months in pigs and above 6 months in rabbits.
- No licence will be required for rearing pigs or dogs up to 5 numbers.
- The minimum farm area required to start a livestock farm has been redefined as follows: from 1 cent for 1 cattle to 1 cent for 3 cattle; from 1 cent for 4 goats to 1 cent for 10 goats; from 1 cent for 10 rabbits to 1 cent for 20 rabbits; and 1 cent for 15 hen/ducks to 1 cent for 250 hen/ducks.
- Pollution control requirements have been redefined scientifically, with the promotion of modern effluent treatment plants in livestock farms. The definition of a manure pit will be made more scientific, as an attachment to the animal/bird shed suitable for collecting the bio/solid waste in accordance with the herd size (bird/animals) with proper roofing for pollution control. Roofing will be made mandatory

for manure/compost pits for farms with 5-10 animals, 100-500 birds and less than 5 pigs.

- When a livestock farm is directed to be closed by the authorities, instead of immediate closure presently, a closure period of 15 days will be permitted to ensure the welfare of the animals.

These changes will go a long way in ushering in new private investment into the sector, particularly of return migrants from West Asia.

Research output

The Kerala Veterinary and Animal Sciences University (KVASU) developed and patented a vaccine for Riemerella in ducks. KVASU also introduced a farmer-friendly Anaemia Card to easily detect and stage anaemia in goats. A curd-setting incubator was developed by KVASU to improve curd quality, with the technology already transferred for commercial production. It also released a new backyard poultry breed named Thriveni, which was bred from White Leghorn, Tellicherry, and Rhode Island Red; the new breed can yield around 180 eggs per year. The Chaithra meat line of Kuttanad ducks was selectively bred, which attains a body weight of 1.5 kg at 8 weeks under intensive systems.

The KVASU also completed the construction of a modern referral analytical and diagnostic laboratory (RADL) to support diagnosis of zoonotic diseases in Kerala. This new laboratory will facilitate the diagnosis of new and emerging diseases that are considered a threat to the animal life and health as well as various zoonotic disease control measures.

Integration with Local Self-Governments

The Animal Husbandry and Dairy Departments have historically been leaders in integrating activities and sourcing funds from the budgets of LSGs. This increased after 2016-17. For example, if the share of the LSG budgets set aside for the Dairy Development Department was Rs 100 crore in 2024-25, the actual expenditure was significantly higher at Rs 158 crore, on account of spending by Gram Panchayats. Panchayat funds are utilised to provide milk incentives, as well as subsidies for various asset creation, infrastructural and entrepreneurial activities in the livestock sector. The funds from LSGs have also been used to provide relief to dairy farmers to bear the prohibitive cost of cattle feed. For instance, LSGs provide up to 33 per cent subsidy on the cost of cattle feed, which is currently priced at about Rs 1,500 per bag of 50 kg.

Most activities of the Animal Husbandry and Dairy Departments, such as the establishment of heifer parks, implementation of the Kerala Chicken project, expanding fodder cultivation, establishing silage units, initiating joint liability groups and self-help groups of women entrepreneurs, and providing training for modern and scientific animal management techniques, are organised in active collaboration with LSGs. In many ways, these collaborations may be considered as a model for emulation by other departments in the productive sector.

Tasks and Challenges

The livestock sector faces short-term, medium-term, and long-term challenges.

Breeding inefficiency. Though the penetration and the availability of technicians in artificial insemination are superior in Kerala, the conception rates are still low. Considering the tropical climatic conditions in the State, conception rates must be raised. Alongside, progeny outcomes are inadequately monitored. Several farmers complain of heifer wastage and a high culling rate after the first lactation due to poor lactation yields.

Feed and fodder deficiency. The largest cultivated fodder variety in the State is Hybrid Napier and Guineas Grass. There is a major gap between the demand and supply of feed and fodder in Kerala. Kerala produces only 60 per cent of the roughage required for its cattle. There were several efforts by the State Government to close the gap through production of fodder in farmer's fields, and fodder production in barren lands and wastelands. The Kerala Feeds Limited Increased its daily cattle feed production capacity to 1,750 MT and initiated an ambitious project on cultivation of maize. But these measures were not fully successful. Consequently, dairy farming is still heavily reliant on the import of commercial feed from the neighbouring States.

In 2024-25, there were 7,462 fodder plots in the State, of which 5,578 plots (or 74.8 per cent) were sized between one acre and 2.5 acres. There were 1,681 plots (or 22.5 per cent) that were sized between 2.5 acres and 5 acres. There are only 203 plots (or 2.7 per cent) plots that were sized more than five acres. Further, the number of fodder plots decreased in 2023-24 and 2024-25 compared to the preceding years.

Disease burden. The emergence of haemoprotozoan diseases in cattle, such as Theileriosis and Babesiosis, is a major issue. Under fluctuating weather conditions, the causative organisms multiply and result in severe disease conditions. Rapid and accurate diagnosis at initial stages is essential for effective treatment and for minimising losses. But there is an inadequacy of diagnostic

Table 13.6 *Levels of yield of milk per cow, selected States, 2024-25* in litres per day

States	Yield of cows of type		
	Crossbred	Indigenous	Non-descript
Punjab	13.25	9.44	8.8
Kerala	11.2	2.38	3.93
Haryana	10.74	7.6	6.65
Gujarat	10.06	5.3	4.47
Maharashtra	10.2	4.02	2.23
Karnataka	10.7	3.5	3.82
India	8.95	4.3	3.48

Source: Ministry of Fisheries, Animal Husbandry and Dairying, Government of India

infrastructure, including in facilities to diagnose the presence of disease-causing organisms using PCR tests. Apart from existing diseases like mastitis, new contagious diseases like the Lumpy Skin Disease have also spread and caused major losses in recent years.

Human-animal interface. Most dairy farmers in Kerala live near forest areas. Consequent to the losses to crops, animals, human life, and infrastructure, households are moving out of these areas in large numbers. In many cases, the threat of wild animals prevents farmers from venturing out to collect fodder for their animals or travel to the nearest milk collection centres to deposit milk in the darkness of early mornings.

Fragmented programme delivery. There continues to be sufficient scope for improving the convergence of services provided across various projects, schemes, and programs implemented by multiple agencies in the livestock sector.

Limitations in incentive systems. While a large number of flat-rate subsidy schemes are in operation, these subsidies are not linked to productivity or quality. Incentives can be linked to productivity-enhancing technologies and practices, adoption of innovations in animal husbandry.

Inadequate technology and service delivery. While the use of information and communication technology has expanded in the livestock sector, there is continuing scope to increase the adoption of mobile data applications, advisories, and real-time data collection mechanisms.

The yield challenge in dairy

Most of the cattle population in Kerala (about 95 per cent) are crossbred, unlike other States, where most of the cattle population is indigenous and non-descript. Due to this feature, Kerala has the distinction of enjoying the second highest level of yield of milk in the category of crossbred cows. In 2024-25, Kerala's milk yield in this category was 11.2 litres per day, only behind Punjab at 13.25 litres per day and Chandigarh at 12.22 litres per day (Table 13.6).

Studies show that low lactation yields have been a persistent problem in the dairy sector. Average lactation yield in Kerala is lower than the first lactation yield of the progeny testing schemes operating in the State. In Kerala, it indicates that calves are not managed scientifically to exploit their potential production possibilities during the growth period. There are major lacunae in the feeding and management of the milking animals resulting in lower peak yields, poor persistency in lactation, and lower total lactation yields.

Kerala must urgently concentrate its efforts to rapidly raise its average yield of milk among crossbred cattle to levels above 12 litres per day. The State Planning Board has been part of detailed discussions to chalk out a strategy in this regard with both the Animal Husbandry Department and the Kerala Veterinary and Animal Sciences University (KVASU). The consensus view that has emerged from these scientific consultations is that Kerala must focus on renewed strategy that emphasises breeding and feeding along with other interventions.

Breeding

There have been multiple initiatives in the 14th Plan period to improve the genetic quality of cattle stock in Kerala. The Calf Feed Subsidy Scheme under the Special Livestock Breeding Programme (SLBP) was remodelled to promote early growth and higher lifetime milk yield. A Genomic Research Laboratory, established under the

Kerala Livestock Development Board (KLDB)-IISER joint project at Kudappanakunnu, uses CRISPR-Cas9 gene editing technology to identify and incorporate genes on disease resistance and improved productivity. An Embryo Transfer Project was launched by the KLDB at the Mattupetty farm to produce high genetic merit calves within shorter timeframes. Artificial insemination services for goats were extended to 1,153 artificial insemination centres, thus expanding the coverage in small ruminant breeding. The KLDB, in collaboration with the Digital University of Kerala, developed the ADAPT software (Application for Data Analysis in Progeny Testing Programme), which integrates digital data collection and genetic evaluation through a mobile app.

There is a need to further expand the quantum and quality of these interventions in the coming years. The focus must be to increase the conception rate through better artificial insemination services, promotion of the use of progeny-tested bulls for semen production, expansion of the use of embryo transfer and IVF in elite farms, and the conservation of native breeds through breed-specific cooperatives.

To accelerate genetic improvement in dairy cattle, genomic selection must be adopted as a regular practice. Recognising this need, the KLDB established the Centre for Applied Livestock Genomics with a focus on harnessing DNA-based tools for scientifically guided breeding decisions. The key objectives of this initiative are early genomic selection of bull calves; screening for undesirable traits; publication of Estimated Breeding Values (EBV); cost-effective rearing of AI bulls; shortening generation interval; improved selection accuracy; higher selection intensity; control of inbreeding; and DNA-based selection of elite females. Through these advanced genomic tools and strategies, KLDB must become able to revolutionise Kerala's breeding programme, thus paving the way for a more productive, genetically superior, and sustainable dairy sector.

Feed and fodder

Kerala needs a large-scale, participative, and campaign mode programme to expand fodder cultivation. It must be able to identify and convert areas in suitable locations and a part of the currently fallow agricultural land to enable the intensive cultivation of grasses and forage crops. The area cultivated with Hybrid Napier and Guinea Grass must be increased and scientific practices must be promoted with the establishment of irrigation facilities. There must also be a popularisation of silage making units, which make use of the surplus fodder during the monsoon season. The processing and storage of fodder during monsoon seasons must be promoted with mechanised units. The subsidy available for mechanisation in agriculture and allied sectors could be better tapped for this purpose.

Studies by the KLDB show that the cultivation of Hybrid Napier could be extremely viable in Kerala's conditions. In a three-year cycle, the expected yield of green grass could be 100 MT per ha in the first year over three harvests, 250 MT per ha in the second year over five harvests, and 250 MT per ha in the third year over five harvests. These correspond to the equivalent yield of 3 kg per square metre per cut in the first year, and 5 kg to 8 kg per square metre per cut from the second year. Irrigated conditions can provide even seven cuts in the second and third years, which would raise the yields to 350 MT per ha. The period of cultivation of one crop can be extended up to five years, though the yields in the fourth and fifth years are likely to be lower. If assume the price of green grass to be Rs 2 per kg, and the byproduct of true-to-type slips to be Rs 1 per cutting, the total net profit over 3 years from Hybrid Napier is estimated by the KLDB to be Rs 7.9 lakhs per ha, much higher than for most crops.

Kerala must actively promote maize cultivation. It could promote the cultivation of bushy and perennial fodder crops like Subabul, Sesbania, Desmanthus, and mulberry along with the already cultivated varieties. Village-level fodder banks and silage units can be set up. Policy must better integrate fodder cultivation which the cultivation of coconut and banana, as well as in the initial periods within rubber plantations. Straw, hay, and other dried fodder could be distributed through dairy cooperatives to eliminate the intermediary vendors and ensure a flow of benefit to the farm gate. Schemes must actively incentivise fodder entrepreneurship and cooperative fodder units. Supply chains, supported by ICT, must be established for fodder distribution linking farmers, producers, SHGs and cooperatives.

The integration of research and extension services is essential in the realms of both breeding and feeding. In research, a Centre of Excellence could be initiated at KVASU to deepen research on breeding, feeding, and inducing climate resilience. In extension, farmer field schools and youth livestock academies could be launched focusing on model farmers. Special extension programmes must also be initiated to popularise the use of Total Mixed Ration (TMR) in feeding.

Increasing egg production

Kerala was a net exporter of eggs to other parts of India till the 1970s, with Chengannur and Kottarakkara

railway stations famous for being centres of rail transport of eggs. If supply far exceeded the demand in those days, the situation is the opposite today. Kerala produced 251 crore eggs in 2024-25. But its annual consumption demand is estimated to be 580 crore eggs. Today, Kerala is estimated to be importing about 300 crore hen eggs and about 40 crore duck eggs every year worth around Rs 1,500 crore.

Given Kerala's unique geographical features, backyard poultry rearing is more suitable than large-scale commercial egg production. The possibilities of poultry cooperatives and producer companies should also be actively explored. But even for backyard poultry rearing, Kerala does not have enough day-old, low input technology breed chicks. Consequently, farmers are dependent on private firms outside Kerala for these chicks. To produce an additional 350 crore eggs, Kerala would need an additional 166 lakh birds in lay with a yield of 180 eggs per year. This implies that the State must produce an additional 332 lakh day-old layer chicks per year in addition to the existing production of chicks.

To meet this requirement, Kerala must produce as much day-old chicks as possible through the Government hatcheries by rearing more parent stock. Small-layer breeding farms can be started under the Kerala Chicken project through its various stakeholders so that hatching eggs can be purchased back from them. There must be a decentralisation of chick production with more hatcheries, breeder farms and mother farms. Birds with more yields of low input technology breeds may be supplied in backyards. Duck farming must also be included in the backyard rearing units, where possible. Commercial egg production units may also be encouraged with incentives and feed subsidies. More suitable backyard breeds with higher yields and better acclimatisation must be developed by the research institutions.

The availability of poultry feed is a major constraint in increasing egg production. About 75 per cent of the cost of production of eggs is the cost of poultry feed. Currently, the total sale of commercial poultry feed in Kerala (broiler and layer) is about 13,000 MT per month. Almost all the supply of such feed comes from outside Kerala. If the state must produce 10 lakh broiler birds per day, the requirement of broiler feed alone would be 18,750 MT per month and 2.25 lakh MT per year. This means that for self-sufficiency, Kerala must produce an additional 15,000 MT to 16,000 MT of poultry feed per month. But no public sector or private sector entity in the State is even a worthy player in this business today. Clearly, large private sector investment needs to be invited in poultry feed production if adequate supply is to be ensured in the coming years.

There are also aspects of marketing, quality and safety, and waste management involved in the poultry sector. When the sector grows, more aggregation facilities, cold storage facilities, and retail outlets would be needed. Strict regulations may be necessary in shed management, and the quality of chicks, feed and water. Laboratory facilities will also be required to test for antibiotic residues. Dry rendering plants are very few in the State today, which will need to be expanded.

Increasing meat production

Kerala is an ideal State in India for the development of a meat production and processing sector, given its highly literate population, favourable political environment, and awareness about a balanced nutritional requirement. While meat production has marginally risen with the success of schemes like Kerala Chicken, a more rapid increase in production is necessary. The annual requirement of meat in Kerala is estimated as 7 lakh tonnes, while the actual production is only 5.2 lakh tonnes. Only 10 per cent of the meat consumed in Kerala is produced from domestic animals, and about 90 per cent of the meat consumed in Kerala is sourced from animals imported from outside the State. Thus, Kerala needs not just a larger livestock population but also expanded facilities for slaughtering and processing.

There is also a lack of scientific infrastructure for the processing and marketing of meat in Kerala. There are large number of illicit slaughterhouses and a general inadequacy of waste management facilities. There is also poor support for new product development, value addition and innovation in addition to the lack of trained human resources.

The State Planning Board (2022) outlined the various targets and deliverables as well as strategic action plan that encompassed livestock production, marketing and value addition. The objective was to carefully promote the growth of scientifically-managed, clean, and hygienic slaughterhouses across the State, particularly in identified border areas and at least one in each district and corporation. Clean modern meat stalls must be established in all cities, towns, and Panchayats. All meat handlers and butchers must undergo mandatory training provided by an approved agency. Pig slaughterhouses must be separately established in selected Municipal Corporation and Districts.

Separate plans must be established in each District and Municipal Corporation for dead animals and waste

from meat and poultry stalls. All integrated abattoirs in the State must be staffed by veterinary officers, who should be certified doctors. A Meat Board must be established to organise and coordinate all activities to augment the meat sector in the State, including registration of stakeholders, channelisation of funds, backward and forward linkages to farmers, regulation of input production and supply, processing and marketing, and regulation of waste management.

The Kudumbashree Mission has identified the high cost of poultry feed and its inconsistent quality across the year as significant challenges. In addition, seasonal variations in prices and frequent market volatilities create uncertainties in the poultry revenue model. Meeting competition from industrial scale poultry farms is a challenge. The multiple regulatory requirements and approvals create an additional financial burden on poultry farmers. To meet these challenges, the Kudumbashree Mission will have to intensively enter the sphere of processed and value-added products, including frozen and marinated products, in its portfolio. It must expand into all the districts of Kerala and through a decentralised network of small-scale decentralised value-addition units in every block of the State. Diversification must also include expansion of retail outlets, including innovative systems like Meat on Wheels.

Ease of doing livestock

The State Planning Board has drawn up a framework to promote the ease of entrepreneurship in the sector. It calls for the creation of a Livestock Entrepreneurship Index (LEI) and the transformation of the KVASU Directorate of Entrepreneurship into a State Livestock Entrepreneurship Facilitation Centre (SLEFC). The SLEFC should register aspiring entrepreneurs and provide them with research support, training, and technology transfer, while the LEI measures how many applicants successfully become enterprises and investors. A single-window licensing and certification system for new entrepreneurs and a State-level data bank of entrepreneurs should also be introduced.

Credit facilitation centres with representation from the Kerala banks, nationalised banks, and cooperative societies must be established in every District, ensuring that annual credit plans of each District address livestock needs. Kisan Credit Cards must reach all eligible farmers, and credit institutions should offer interest subvention, credit guarantees, and extended repayment periods for livestock loans. The District-level centres must also provide project management support.

The State must also revive and effectively implement special livestock and dairy zones, offering tax and fee exemptions, relaxed regulations including on herd size, and preferential land policies to livestock farms and industrial breeding establishments that meet biosafety and sustainability norms. Such reforms will support vertical integration to promote scale and efficiency, when consumer demand for high-quality, long shelf-life products is rising.

Strengthening farmer producer groups, especially in the Kudumbashree model, can improve primary procurement, value addition, and integrated livestock-fish-poultry models. Finally, capacity building must extend across institutions, linking engineering and food technology programmes to livestock entrepreneurship, including training for marketing strategies, while strengthening KVASU's ability to develop standards for mechanisation, phytosanitary measures, technology transfer, and export strategies.

Policies

Major initiatives were taken over the 14th Plan period to improve the investment atmosphere in the livestock sector. Entrepreneurship in the livestock sector is currently confined to dairy farming and poultry farming as well as marketing of raw milk, egg and meat. There is little investment in value-added and processed ready-to-eat or -drink livestock products. Secondly, availing financial assistance to start a new livestock venture is not easy. Apart from the shortage of suitable loan products, there is also less awareness among the new aspirants about the various subsidy and assistance programs of the Union and State Governments that promote entrepreneurship. Thirdly, there is limited promotion of innovations, startups, and technology business incubation centres in the sector. Finally, there are deficits in the availability and provision of training, skill development, project preparation assistance and product marketing assistance to the new entrepreneurs.

Kerala needs early detection and timely handling of livestock and poultry diseases, especially diseases that can infect humans too. There must be regular collection of surveillance samples to predict and forecast infectious diseases early enough, such as avian influenza, foot-and-mouth disease, tuberculosis, African swine fever, and animal rabies. Post-vaccination surveillance is also necessary to assess the protection rate for dangerous infectious diseases. More mobile diagnostic labs and integrated disease surveillance units are required in remote areas. Vector control programmes must be

promoted at the Panchayat-level. The supply chain for vaccine depots and cold storage units must be made more efficient.

There is also a need to promote the production and use of generic veterinary medicines and ethno-veterinary formulations including the establishment of an efficient supply chain that links firms that produce, veterinary institutions that prescribe and cooperatives that could deliver.

To address the increasing instances of human-animal interface, policy must subsidise the construction of predator-proof fencing and livestock shelters in identified areas. Forest officers must be integrated with efforts in livestock protection planning in the forest fringes.

Promotion of technology must encompass all areas in the livestock sector. Multilingual mobile applications must be developed for real-time farmer registration, disease reporting, scheduling of artificial insemination, and supply of feed advisories. The existing e-Samrudha scheme can be developed as a state-of-the-art digital technology platform in the animal husbandry and dairy sectors. Subsidies in the animal husbandry sector must be performance-linked, which rewards higher yield, improved animal health, and voluntariness to share data. Incentives may also be provided specifically for the conservation of indigenous breeds, participation in community fodder cultivation, and adoption of mobile monitoring tools.

To improve convergence, policy must envisage the launch of a Kerala Livestock Innovation Mission (KLIM) that would integrate the activities of all livestock-related agencies. Livestock planning cells could also be introduced in the Local Self-Governments at the District and Block levels. Convergence could also be improved by transitioning into the implementation of One Health Planning, which effectively integrates concerns related to human, animal, and environmental health.

Way Forward

There were significant achievements over the 14th Plan period in Kerala's animal husbandry sector. They included the arrest of a long-term decline of production in key sub sectors, and the revival of growth. This chapter discussed the major challenges and opportunities in the animal husbandry sector with special reference to the need to focus on breeding and feeding practices. Space limitations allowed discussion of only certain topics and animals. Nevertheless, it highlighted the newly needed policy and programmatic interventions, challenges, and actionable strategies for future development. Successful models within Kerala and elsewhere show that a coordinated, decentralised, and climate-resilient approach can increase productivity and farmer incomes.

Kerala's animal husbandry sector offers immense scope for sustainable, inclusive growth if guided by evidence-based policies and integrated implementation. Strategic investments in breeding and feeding coupled with technology-enabled service delivery, scientific resource planning, and reformed subsidy mechanisms will be crucial for its future transformation.

Marine and Inland Fish Production in Kerala

The development of the fisheries sector in Kerala has been a success story of the last decade. Production of fish, both marine and inland, grew remarkably in recent years. This record growth was achieved despite the constraints on trade imposed by the developing world, extreme climate events, and a national environment of declining public investment in the coastal economies. Successes in the marine fisheries sector were achieved by means of policies and plans that focused on sustainable fishing, improved harbour infrastructure, strong social protection to fish-worker households, and strong regulation. The State Government's initiatives with regard to the protection of coastal households from natural calamities have attracted national attention. Growth in the inland fisheries sector was based on policies that promoted appropriate technologies on smaller scales. There have also been notable achievements in the fish export processing sector, despite the persistence of a harsh external trade environment. Future growth in the sector must focus on expanding gains in the inland fisheries sector, with special attention being paid to inland aquaculture and reservoir fishing, increased private investment in processing, and moving on to deep-sea fishing facilitated by cooperative and collective units of fisheries workers themselves.

Nationally, the fisheries sector is designated as a "sunrise sector", and India is the second-largest fish producer in the world. Kerala is richly endowed with marine and freshwater fish resources. Fisheries sector contributes nearly 1 per cent to the Gross State Value Added (GVA). The sector contributes substantially to employment generation, food and nutritional security, and foreign exchange earnings. Fishing is the main source of livelihood for the coastal communities of Kerala. About 10.7 lakh persons (3 per cent of Kerala's

Table 13.7 *Profile of the fisheries sector in Kerala, 2015-16 and 2024-25*

Human Resources	2015-16	2024-25
Fishing villages	335	335
Fisher population	10,23,796	10,70,686
Marine fisher population	7,88,324	8,24,466
Inland fisher population	2,35,472	2,46,220
Active fisher population*	2,33,126	3,03,524
Infrastructure	**2015-16**	**2024-25**
Landing centres	271	688
Major fishing harbours	7	7
Minor fishing harbours	12	14
Major ports	1	2
Intermediate ports	1	3
Minor ports	6	13
Mechanised vessels	3,819	3,789
Motorised vessels	29,035	31,685
Traditional vessels	2,281	3,628
Processing/ support facilities	**2015-16**	**2024-25**
Ice plants	312	334
Cold storages	31	52
Peeling sheds	1	1
Economics	**2015-16**	**2024-25**
Fish production, in lakh MT	7.3	9.3
Marine fish production, in lakh MT	5.2	6.5
Inland fish production, in lakh MT	2.1	2.8
Marine fish export quantity, in MT	1,49,138	1,79,659
Value of fish exports, in Rs crore	5,166.1	6,941.3
GVA, fisheries & aquaculture, in Rs crore	8,343.6	TBA
Per capita GVA of fishers, in Rs	81,496	TBA

Source: Department of Fisheries, GoK

Note: * Active fishers include both active fishers and those engaged in allied fisheries activities.

population) were engaged in the fisheries sector in 2024-25 (Table 13.7), of which, 8.2 lakh persons were engaged in the marine fisheries sector and 2.5 lakh were in the inland aquaculture sector.

Kerala ranks third among the States in marine fish catch, trailing only Gujarat and Tamil Nadu. In 2024-25, the State exported 1.8 lakh MT of seafood, generating Rs 6,941.3 crore in export revenue. The State Government continues to prioritise the sector through investments in infrastructure (harbours, landing centres, roads, housing, and sanitation), spending on welfare schemes (insurance and income transfers, pensions, and education support), and resource conservation (preventing coastal erosion) to boost productivity and improve the socioeconomic well-being of fishing communities. At the same time, Kerala's inland fish production remains relatively low despite rich freshwater resources.

Fish Production in Kerala

At the rate of about 25 kg per person per year, Kerala's annual fish consumption stands at approximately 8.8 lakh tonnes (about 2,410 tonnes daily). The annual fish production from marine and inland fisheries stands at around 8.3 lakh tonnes (Table 13.8). After losses, exports and diversion to industrial uses, about 5.5 lakh tonnes are available for consumption. Hence, about 3.3 lakh tonnes are sourced from other States or countries, particularly to cater to the urban markets. Kerala must aim to attain self-sufficiency. At the same time, the demand for fish consumption in Kerala is projected to increase even further by 2030 and 2035.

Marine fish production

Kerala has a coastline of 600 km, which is 10 per cent of India's total coastline. Its continental shelf is of 38,700 sq km, with an exclusive economic zone (EEZ) of 2,18,536 sq km. Of the 8.2 lakh persons engaged in the marine fisheries sector, about 3 lakh persons are directly dependent the sector. Women dominate the allied activities in fishing. About 79 per cent of those engaged in the marine fishing-allied activities are women. The share of women engaged is 84 per cent in marketing, 96 per cent in curing/processing, and 99 per cent in peeling. Kerala's marine fisheries sector recorded its highest catch in a decade in 2022 i.e., 6.9 lakh tonnes, which remains within the estimated catchable resource potential of 7.5 lakh tonnes. This marked a 24 per cent increase the landing in 2022 i.e., 5.6 lakh tonnes.

Marine fish landings in Kerala have shown significant fluctuations over the recent years (Figure 13.15). However, the key takeaway from Figure 13.15 is that marine fish production, which was on a declining trend between 2006-07 and 2017-18, rose significantly from 4.8 lakh tonnes in 2017-18 to 6.9 lakh tonnes in 2022-23 and 6.5 lakh tonnes in 2024-25. The increase in marine fish production contributed substantially to the rise in overall fish production in the State.

A number of policy initiatives contributed to the rise of marine fish production. The reasons identified for the fall of marine fish production from 2006-07 were climate variations, increased fishing capacity, and juvenile fishing among others. Therefore, fisheries policy during the 13th Plan period focused on adopting sustainable fishery management measures and ensuring responsible fishing practices, eco-labelling, and certification for fetching better values to the catch. The Kerala Marine Fishing Regulation Act, 1980 was amended in September 2017. In these amendments, thrust was given to participatory management. Fisheries Management Councils (FMC) was setup at the State, District, and village levels with the active participation of fishers. Similarly, participatory Harbour Management Societies were also set up in all major fishing harbours.

The 2017 amendments ensured that fishing in any specified area by fishing vessels of more than 20 m Length Overall (LOA) was prohibited. The minimum legal sizes of 58 commercially important species were fixed. From 2018 onwards, the trawling ban period was

Table 13.8 *The estimated demand-supply scenario in fisheries, Kerala, 2023-24*

(a) Total marine fish production	5.8 lakh tonnes
(b) Total inland fish production	2.5 lakh tonnes
Total fish production	8.3 lakh tonnes
(a) Losses @ ~20 per cent of total production	1.7 lakh tonnes
(b) Exports @ ~13 per cent of marine production	0.8 lakh tonnes
(c) Industrial uses @ ~7 per cent of marine prodution	0.4 lakh tonnes
Production unavailable for local consumption	2.8 lakh tonnes
Net production available for local consumption	5.5 lakh tonnes
Per capita fish consumption	25 kg
Total local consumption @ 25 kg per person	8.8 lakh tonnes
Production required for self-sufficiency	11.6 lakh tonnes
Deficit in production	3.3 lakh tonnes

Source: Estimated from various sources at the State Planning Board

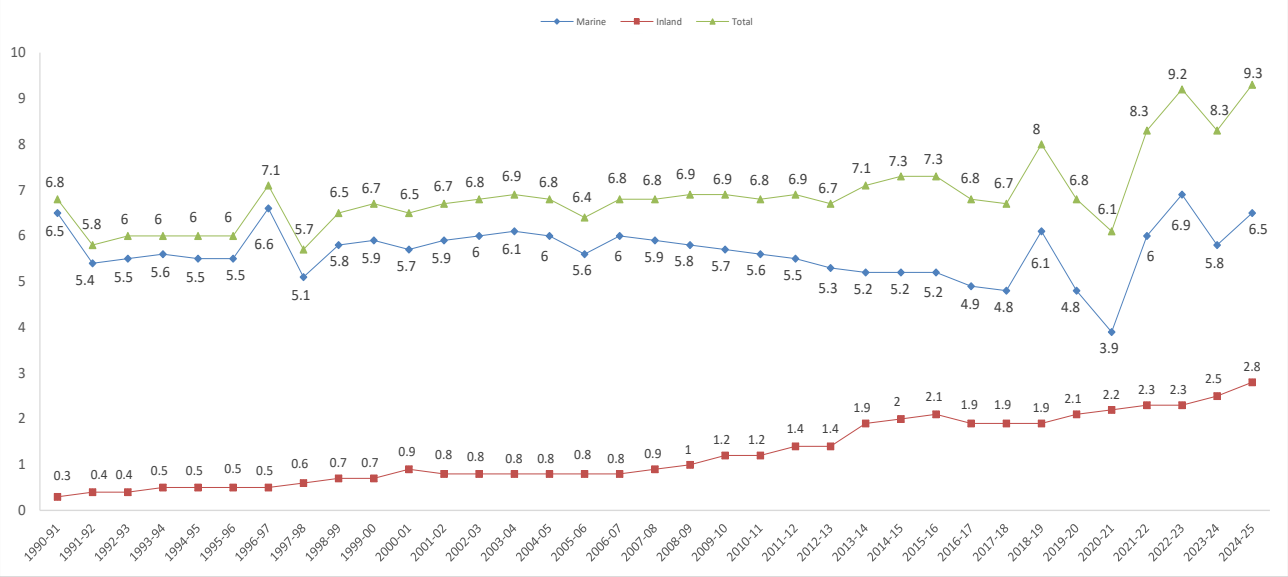


Figure 13.15 *Trends in fish production in Kerala, marine and inland 1990-91 to 2024-25* in lakh tonnes
Source: Kerala State Planning Board

raised from 47 days to 52 days. Unscientific fishing methods were banned; bottom trawl was prohibited from sunset to sunrise; fishing using destructive methods was prohibited; banmesh size regulations were issued for major fishing gears; online registration, licensing, colour coding and holographic registration plates were introduced for fishing vessels; and life-saving appliances and fire-fighting equipment were installed in fishing vessels. To replenish marine fish stock, artificial reefs were established off the coasts using trapezoidal RCC modules from 2018 onwards. By 2021-22, about 4,190 artificial reefs were established in 16 fishing villages. By 2023-24, 6,300 artificial reefs were established in 33 fishing villages. Subsidies were introduced and expanded for the motorisation of country crafts. These policy initiatives kicked off revival in marine fish production after 2017.

Nevertheless, while Kerala has access to a vast EEZ, its contribution to the national marine fish catch remains modest, accounting for only about 5.5 per cent. Moreover, nearshore fish stocks continue to be under considerable stress. It is estimated that Kerala has already attained close-to- optimum level of production in marine fish. Thus, it is high time that the State taps into its potential in developing the inland fisheries sector.

Inland fish production

Inland fisheries sector encompasses both capture fisheries (rivers, backwaters, lakes, resevoirs) and culture-based systems (ponds, paddy fields, reservoirs). The State has 46,129 hectares of backwaters and rivers, 0.15 million hectares of brackish water, and 0.2 million hectares of freshwater resources. Brackish water ecosystems, such as estuaries and backwaters, support around 75 fish species, of which 28 are commercially important including sardines, prawns, catfishes, and mussels. Additionally, water bodies originating from the Western Ghats, a biodiversity hotspot, host 210 freshwater species, including 53 endemic and several ornamental varieties.

Inland fish production grew remarkably in Kerala from 1.9 lakh tonnes in 2016-17 to 2.8 lakh tonnes in 2024-25 (Figure 13.15). Even during the period when marine fish production was declining, inland fish production continued to grow and helped maintain a momentum in overall fish production. Over the years, the contribution of carp, shrimp, and mussels in the total inland fish production declined, and the contribution of tilapia, pangasius, and pearl spot increased. Largely, inland fish production comes from semi-intensive, pond-based culture.

In the 13th Plan period, the focus of policy was on increasing seed production of important cultivable species of fish and shellfish, establishment of fish feed mills to ensure quality feed, and establishment of aquatic animal health labs. A major achievement was that inland fishing, once considered as natural, pond-based, and seasonal, became more artificial, tank-based, and perennial. In other words, inland fishing evolved from simple household ponds to more high-tech intensive systems, aimed at both domestic consumption and export-oriented production. This growth was further

ably guided by Government initiatives in the 14th Plan period, technological adoption, and diversification into species like tilapia and catla. The targeted initiatives included Subhiksha Keralam and Janakeeya Matsyakrishi, implemented in partnership with Local Self-Governments (LSGs).

Following the earlier Subhiksha Keralam scheme, the Janakeeya Matsyakrishi scheme was aimed at promoting sustainable and inclusive inland fisheries development. The scheme sought to promote integrated, freshwater fish farming systems in ponds, canals, and paddy fields to reduce dependency on marine fisheries. Sustainable and eco-friendly practices like organic aquaculture were encouraged. The scheme emphasised community participation, livelihood enhancement, and eco-friendly practices to boost fish production while ensuring food security and economic empowerment of local communities. It also provided financial and technical assistance and credit to traditional fishermen, SC/ST communities, and women-led self-help groups (SHGs) for pond construction, fish seed procurement, feed, and equipment. The collective fish farming models were led by the Matsyafed. The implementation was in collaboration with local self-governments, Kerala University of Fisheries and Ocean Studies (KUFOS) and Krishi Vigyan Kendras (KVKs).

An important feature of these assessments was that they were science-based. A unified Package of Aquaculture Practices was published. Another document on Standard Operating Procedures on Aquatic Animal Health Management was also published to avoid unscientific disease management practices. The implementation of the scheme was through establishing more matsya bhavans for improved extension activities, and through project coordinators and aquaculture promoters at the level of LSGs, who served as active extension agents. The Fisheries Management Councils contributed to the scheme through seed ranching and the establishment of protected areas for fish and clams in the lakes of Ashtamudi and Vembanad. They also helped regulate the use of small-meshed nets to avoid the capture of released young fish seeds in rivers and lakes.

Considerable progress was achieved in the scheme's implementation. The practice of one paddy-one fish was implemented in *padasekharams* of area 4,951 ha; fish farming was started in 4,319 ha of ponds and in 2,083 cage farm units, 240 recirculatory aquaculture units, and 3,475 *padutha* ponds; and 1,610 mussel units were initiated. In these units, the State Government provides a 40 per cent subsidy for fish feed and a 70-100 per cent subsidy for fish seed as grant. These apart, as part of the earlier Subhiksha Keralam scheme, LSGs dropped fish seeds in 3,575 ponds between 2020-21 and 2024-25. Further on, LSGs also implemented an embankment project, where fish farming was initiated in larger water bodies by constructing smaller barriers and check dams; between 2020-21 and 2024-25, this project was implemented in an area of 41 ha, and in another 56 units inside house plots.

Assessments of the schemes show that through innovative farming practices, and the adoption of aeration, probiotics, and bio security measures, the typical average production of one tonne per hectare increased to one tonne per 2 cents of area in many regions. They also showed challenges, which included constraints of land and water availability, as well as the need for stronger market networks to ensure profitability for small-scale farmers. Yet, the scheme reflected the Government's commitment to decentralised and sustainable fisheries development. By integrating community participation, eco-friendly practices, and government support, the scheme has the potential to transform inland fisheries while ensuring food security and livelihood enhancement.

Reservoir fishing is an area of enormous opportunity in Kerala. Kerala has 47 reservoirs with a total area of 34,000 ha, which includes 37 small reservoirs, 9 medium reservoirs, and one major reservoir. In Kerala, reservoir fisheries started in the 1960s through regular fish seed stocking and fishing. Subsequently, in the 1980s, fishermen cooperatives were formed by mobilising the SC/ST population living around the reservoirs that were given permission to fish in the respective reservoirs. Of the 47 reservoirs, 10 reservoirs were used for Fish Stock Enhancement Programme under Indo-German Reservoir Fisheries Development Project in the 1990s, which became a successful participatory model.

During the 13th and 14th Plan periods, fish stock enhancement programmes - through the ranching of seeds - was extended to the reservoirs under the project Kerala Reservoir Fisheries Development Project (KRFDP). Presently, reservoirs in Maniyar, Pampa, Ponmudi, Mattupetty, Erattayar, Anayirangal, Meenkara, Pothundy, Kanjirapuzha, Pazhassi, Peringalkuthu, and Lower Sholayar are stocked with carp and indigenous fishes. Also, cage fish farming was undertaken in the reservoirs of Malampuzha, Pazhassi, Banasurasagar, Karappuzha, Peruvannamuzhi, Kakki, Neyyar, Peechi and Idukki reservoirs.

Table 13.9 *Aquaculture fish production, Kerala, 2017-18 to 2023-24* in ha, tonnes, and tonnes/ha

Year	Vannamei			Black Tiger Shrimp			Total production (tons)
	Area in culture	Estimated production	Yield	Area in culture	Estimated production	Yield	
2017-18	52	208	4.0	-	-	-	-
2018-19	53	259	4.9	3,258	1,675	0.51	1,934
2019-20	235	671	2.9	2,823	1,370	0.49	2,041
2020-21	157	421	2.7	2,814	1,129	0.40	1,550
2021-22	141	389	2.8	3,148	1,137	0.36	1,526
2022-23	280	788	2.8	3,032	1,038	0.34	1,826
2023-24	284	804	2.8	3,034	1,048	0.35	1,852

Source: MPEDA

As a result, additional fish production was achieved from the reservoirs to the tune of about 4,000 MT every year between 2020-21 and 2024-25. The project also provided livelihood and earnings to about 5,000 inland fishers, especially from the SC/ST communities residing in the catchment areas.

Inland aquaculture

Aquaculture offers a sustainable solution to overfishing and rising seafood demand. Kerala's total cultured shrimp production, comprising of vannamei, black tiger and other shrimp species, was 2,571 tonnes in 2023-24. The major share of shrimp production consisted of vannamei and black tiger shrimp. Of these two species, the production of vannamei particularly rose from 208 tonnes in 2017-18 to 804 tonnes in 2023-24 (Table 13.9). Various initiatives were undertaken over the 13th and 14th Plan periods to boost aquaculture, including pond fish farming (in 6,554.3 ha), shrimp farming (in 2,346.4 ha), and one paddy one fish farming (in 13,706.1 ha). Innovative techniques, such as biofloc systems, *padutha* pond farming, recirculatory aquaculture, and varal/karimeen units, were popularised.

However, yield in shrimp aquaculture has declined and remains lower than in States such as Andhra Pradesh and Tamil Nadu. The supply of quality fish seed is a key factor of concern. However, with the adoption of improved farming practices, better seed quality, enhanced disease management, and expansion of culture area, Kerala has strong potential to significantly increase its shrimp productivity in the coming years.

Freshwater aquaculture in Kerala has gained momentum with the successful implementation of induced breeding techniques. Species like Catla catla and Labeo fimbriatus were first successfully bred at Malampuzha, which later became a key centre for inland fisheries development in the State. In recent years, advanced aquaculture practices such as cage culture, pen culture, and running water culture have emerged across Kerala, offering significant potential for the productive use of the state's extensive freshwater resources.

Ornamental fish

Ornamental fisheries are a promising micro-enterprise in Kerala, particularly in Ernakulam, Thrissur, and Alappuzha. It offers significant livelihood opportunities for women, youth, and small-scale farmers due to its low investment and space requirements. The State contributes to India's ornamental fish exports through species like guppy, molly, angel, goldfish, and native Etroplus (pearl spot). Leveraging the biodiversity richness of the Western Ghats, Kerala holds a unique advantage in cultivating indigenous species with high global market demand.

Broad assessment

The 13th and 14th Plan periods witnessed significant increases in fish production in Kerala. However, given the increase in consumption, a mismatch between supply and demand has emerged, with an average of 40-60 per cent of domestic fish demand being met through arrivals from neighbouring States and occasional imports. Further increases in marine fish production may emerge only through new initiatives in deep sea fishing. An inference to draw is that Kerala needs to urgently and rapidly increase fish production in the inland sector.

Despite some progress, Kerala's inlands remain underdeveloped in fishing. Its inland fish output is less than 2.5 per cent of India's output, despite Kerala having about 7 per cent of India's fishable inland area. Kerala's 7th rank among States in inland fish production is a reminder that the State has not yet been able to fully utilise the sector's potential. While other States achieve a daily production capacity of around 3,000 kg, Kerala manages only about 300 kg. At the national level, inland fisheries and aquaculture contribute up to 75 per cent of total fish production, but Kerala's contribution in this segment is only 26 per cent. Owing to the availability of water and diversity of fish species in the State, the inland sector can significantly contribute to the fish basket, employability, livelihood enhancement, protein security, and the availability of essential fatty acids, essential amino acids, vitamins, and minerals.

Challenges and the Way Forward

Future growth in production

To attain self-sufficiency, Kerala needs a targeted strategy to double production, with focus on inland aquaculture, is necessary in the next five years. In addition, opportunities for deep sea fishing must also be explored carefully.

Marine production. All studies show that Kerala can harvest about 1 lakh tonne more annually from marine fisheries, excluding deep sea fishing. However, this effort must be preceded by a scientific assessment of the stock status. Only half of the existing stock can be harvested sustainably, and the remaining are in the recovery stage. The stocks that show a steep decline in catch are also largely those primarily targeted by trawlers. Consequently, in addition to the seasonal ban on trawlers, strict regulations are necessary on minimum legal sizes of trawlers, mesh sizes, and dimensions of the gear in ring seines and motorised mechanised vessels. Where legal provisions are already in place, strict implementation is required. Reduction in the total number of registered fleets has also been recommended by many committees.

Kerala has excellent potential for mariculture, with an area of 1,292 ha. Marine fishes like sea bass, groupers, snappers, pompanos, and other carangids are suitable for farming in these identified areas.

The bulk of marine fishing in Kerala occurs in near-shore waters, which is where a general decline of catch is observed. Diversification of fishing into deeper waters to target the less targeted resources is essential. Hence, combination fishing vessels with a Length Overall (LOA) of more than 24 metres are recommended. Such vessels have already been designed by Indian Council of Agricultural Research - Central Institute of Fisheries Technology (ICAR-CIFT) in Kochi. Fishing in deeper waters must be under the overall ownership and participation of traditional fisher groups through their cooperative societies or other collectives.

Deep sea fishing. From 2020-21, the State Government collaborated with the Union Government's scheme Pradhan Mantri Matsya Sampada Yojana (PMSSY) to purchase 10 deep sea fishing vessels for 10 fisher worker groups of 10 persons each. As per the PMSSY guidelines, the cost of one deep sea vessel is stipulated as Rs 1.2 crore. As subsidy, the Union Government and the State Government provide up to Rs 48 lakhs on a 60:40 basis (i.e., Rs 28.8 crore : Rs 19.2 crore). However, the cost of one deep sea vessel with modern facilities manufactured by the Cochin Shipyard is Rs 1.5 crore. In other words, the beneficiaries would have to pay Rs 1.02 crore as their contribution over and above the subsidy.

Realising that the beneficiaries may not be able to mobilise such a large amount, the State Government decided to provide 30 per cent (i.e., Rs 30.6 lakhs) of the beneficiary contribution as a grant, and the remaining 70 per cent (i.e., Rs 71.4 lakhs) as a soft loan from the Kerala Financial Corporation (KFC). Six fishing vessels were distributed to five traditional fisher groups between May and December 2023. The process of purchase and employment of the 10 vessels is expected to be completed by 2026, as four of the ten beneficiaries had backed out of the scheme after remitting their beneficiary share.

Inland production. Inland aquaculture requires a major boost to increase production. A State-level plan must be prepared by identifying all the water bodies available for aquaculture and marking them out using GIS data. Aquaculture operations must be carried out in these areas in a project mode by LSGs. This would enable the full and efficient use and management of natural water bodies for fishing. Aquaculture zones must be established with their own seed and feed production. There must be a defined leasing policy for water bodies. Public ponds not used for fish culture should be cleared and cleaned for fish farming with the participation of local clubs, neighbourhood groups or Kudumbashree groups.

In inland aquaculture, production can be increased by adding more species into the basket of the aquaculture system, by adopting the latest technologies and by expanding aquaculture into new areas. Presently, the major constraints in this field are low availability

and poor quality of seed, disease prevalence, climate risks, lack of credit support, limited research outputs on specific issues, shortage of technical manpower, and lack of proper extension support. Experience shows that aquaculture production can be increased in the short run through the adoption of innovative practices, such as cage aquaculture, biofloc aquaculture and Recirculating Aquaculture System (RAS).

Experience also shows that even when farmers adopted inland aquaculture on a large scale, market and price risks were high, leading to a fall of confidence among farmers. One underlying reason was the choice of fish species. Farming of carp has limitations due to poor consumer acceptance, and hence focus must be shifted to those species which are part of Kerala's diets. Policy must give more preference to the farming of, and the production of fish seeds in, murrel, basa and tilapia. In brackish water areas, pearl spot, milk fish, vannamei shrimp, edible oyster and mud crab must be encouraged. In shallow ponds, farming of air breathing fishes must be encouraged. Such a careful shift of species is expected to reduce market and price risks.

Market risks are also linked to the proliferation of middlemen in fish trading. There must be concrete initiatives to expand new marketing institutions for inland fish including through e-commerce and technology platforms. Better market linkages, storage facilities, and facilities for value addition are necessary to ensure a fair fish price to the farmer. Establishing a network of live fish marketing outlets and chilled storage facilities and the inclusion of fish in the noon meal scheme for school children are possibilities to be explored to enhance demand.

In remote areas, the availability of electric power is an important constraint to productive fish farming. In such areas, renewable sources of energy must be popularised, with financial assistance and subsidies for protection.

The potential for cage farming in quarries and backwaters must be fully explored. Public freshwater ponds may be used for cage farming intensively. Special attention must be given to the filtration fields, such as in the Pokkali and Kaipad regions. Similarly, fields in the Kuttanad and Kole lands must also be utilised for fish culture during gaps in paddy cultivation. The conflicts of interest between connect farmers and fish farmers must be positively addressed and resolved, with the participation of the concerned line departments. Paddy fields may be better utilised by doing nursery rearing in padutha ponds near the fields during the cultivation season and releasing bigger fingerlings into the fields after the paddy harvest. The departments concerned could jointly prepare a production plan to facilitate aquaculture in paddy fields, in consultation with committees at the LSG-level consisting of Panchayat presidents, agricultural officers, fisheries extension officers, and officers of the primary agricultural cooperative societies.

Shrimp farming. The cultivation of vannamei (Leptopenaeus vannamei or white leg shrimp) has gained momentum in recent years due to its faster growth and disease resistance. The introduction of vannamei in India in 2009 occurred under controlled conditions with clear procedures laid down by the Government of India. However, vannamei culture has not become adequately popular in Kerala. The State's share in its national exports has been around 14-15 per cent.

Today, vannamei from Andhra Pradesh is considered as one of the best and freshest quality shrimps in the world. Kerala seafood factories are dependent on arrival of smaller sized vannamei from Andhra Pradesh for processing. Exporters in Andhra Pradesh presently do not have adequate infrastructure to process these smaller-sized farmed shrimps. This situation is presently a fortunate one for exporters based in Kerala, but as soon as Andhra Pradesh factories develop the required infrastructure to handle the smaller sized farmed shrimps, these sizes will not be available to Kerala exporters.

Consequently, it is critical for Kerala to allow year-round shrimp farming in those water bodies where there has been no cultivation for the previous 10 years. The Central Institute of Brackish water Aquaculture (CIBA) has recommended promoting shrimp farming in abandoned paddy fields as a productive land-use strategy. Kerala already practices a rotation system in paddy fields that lie below the sea level, and with saltwater intrusion. There must be an assessment of more areas where such rotation can be practiced. Successful models can be replicated in other regions to enhance aquaculture productivity and rural incomes. If necessary, legal reforms must also be explored to facilitate the process.

Previously farmed areas that were recently inhabited by mangroves should be brought back to fish farming. In these areas, encouragement must be given to the revival of tiger shrimp and white shrimp farming.

Reservoir fishing. One important constraint in reservoir fishing today is the depletion of fish stock due to obstructions imposed by the dam to the breeding activities of fish. Consequently, the population of

endemic carp, indigenous catfishes and mahseer have fallen and the population of exotic species like tilapia have risen. To facilitate the breeding activities of the former fishes, fish ladders or fish ways must be explored around artificial barriers (like dams) to ensure the passage of fishes. Most fish ladders or ways enabled fish to pass around the barriers by swimming and leaping up a series of relatively low steps (hence the term ladder) into the waters on the other side. The velocity of water falling over the steps must be large enough to attract the fish to the ladder, but it cannot be so large that it washes the fishes back downstream or exhaust them to the point of inability to continue their journey upriver.

Stock enhancement of endemic species helps not just to increase fish production upstream but also to enhance conservation. Harvesting can be permitted for tribal groups or other residents living nearby using a large, meshed gill net with the help of coracles so that fish production remains sustainable.

Cage aquaculture can also be explored in reservoirs. Fish cage culture is an advanced mariculture technique where fish are reared in floating net enclosures (cages) placed in open seas or sheltered waters. In India, the National Institute of Ocean Technology (NIOT) has been a pioneer in developing and demonstrating open sea cage culture systems to boost marine fish production and support coastal livelihoods.

In comparison with open reservoir fishing, cage culture effectively multiplies the production from a given water area. A water volume of 96 cubic meters actually potentially produce up to three tonnes of fish in 10 to 12 months. While the normal catch in reservoirs is around 80 to 140 kg per ha. Further, cage culture can generate around 200 to 250 person-days of employment to fishers compared to just 4 or 5 days of employment in open reservoir fishing. Estimates show that in 10 reservoirs of Kerala with an area of 20,275 ha, about 8,200 cage units could be installed to generate a production of 16,400 tonnes. These cage units can be scientifically identified and operated by fisher groups like cooperatives or SHGs.

Ornamental fish production. An existing constraint in exotic ornamental fish production is the lack of sufficient quality in the existing brooders and fish varieties. Kerala could take steps to import quality brood stock and introduced new varieties to enhance production and compete globally. While the import of invasive species may be regulated, inter-state trade of exotic and indigenous ornamental species within India should be unrestricted. The registration and licensing of ornamental fish seed farms and hatcheries should also be streamlined. Institutions like KUFOS could focus on developing standardised breeding and rearing protocols for potential indigenous species, as well as on technology transfer to entrepreneurs. Closer linkages with industry must also be established.

Enhancing fish seed production. Though Kerala has considerably increased fish seed production over the years, the gap between demand and production continues to be large. The Department of Fisheries has initiated a scheme to attain self-sufficiency in fish seed production in Kerala. Under the auspices of the Department, ADAK and Matsyafed, there are 28 hatcheries that produce various fish seeds. Between 2022-23 and 2024-25, the annual production of fish seeds from these hatcheries increased from 12 crore to 17.5 crore. In addition, fish seed production was initiated in 470 backyards, which led to an additional annual production of 1.1 crore fish seeds.

Still, Kerala must establish new hatcheries and further increase the capacity of existing hatcheries. Private sector participation is also required in this field, particularly for tilapia, basa, sea bass, and vannamei. In fish seed production, focus must also be given to rapid genetic improvement of the stock.

Fish seed production is also hindered by the low availability of good quality, balanced, and nutrient-rich feed. Such shortage can be overcome by providing live feed organisms to the young ones, implying the need to initiate live feed culture in all the hatcheries. The survival rate of seeds will be increased by ensuring aeration facilities, modern water quality management, flood protection, and the use of renewable energy.

Resource depletion and sustainability

An ecosystem-based fisheries management can potentially mitigate unsustainable factors at the biological and societal levels in the social and economic dimensions, such as complexity, lack of knowledge, externalities, inadequate governance, poverty, and inappropriate incentives.

Marine sector. In the marine fish sector, nearshore fish stocks are under severe pressure. Overfishing and habitat loss, such as coral reef degradation, mangrove deforestation and pollution, have reduced the availability of some species or imparted high variability in their catch. Anthropogenic impacts, such as industrial effluents and plastic waste, and climate change impacts, such as warming seas and erratic monsoons, have affected spawning and growth. Experts also want

that the adverse impact on marine ecosystems could exacerbate climate impacts in the future. In addition, high juvenile fish catches by non-local boats undermine conservation efforts, and enforcement of mesh rules continues to be uneven.

Marine resource sustainability is crucial for ecological balance and coastal livelihoods. In this context, Kerala must promote responsible marine fishing and ensure the regeneration and sustainability of fishery resources. Uniform control of juvenile fishing and effective conservation measures are needed across maritime States. A stricter quota system is needed to regulate "trash fish" capture, and policy must keep an open mind on extending trawler bans to prevent indiscriminate exploitation. Unregulated fishing by foreign vessels also poses a threat to national marine wealth. Stringent monitoring and enforcement are needed to curb unregulated activities.

Inland sector. In inland fisheries, concerns on sustainability include the proliferation of factors that obstruct natural breeding of fish. Capturing undersized fishes and brooders during their natural breeding season — despite patrolling and imposition of penalties — is one area of concern. About 60 per cent of the total inland capture fisheries is through unlicensed fixed nets like stake nets and Chinese dip nets. These nets are not used by majority of inland fishermen as they are highly capital intensive, and they trap undersized fishes and brooders. Such nets must be discouraged, and fish catches during the high tide must be regulated. Fishes must be allowed to breed at least once in their lifetime so that essential stock is maintained in the natural waters without causing overfishing.

Heavy siltation, dredging operations, construction work, and pollution have resulted in the destruction of natural breeding grounds for inland fish and shellfish. This is particularly so in water bodies with a depth of 3 to 6 metres. They have contributed to a reduction in the seed availability of commercially important fish species. By impeding water flows, they also obstruct breeding migrations and opportunities for brooders to spawn. The dumping of industrial waste, plastic waste, untreated hospital discharge, and domestic sewage form yet another constraint to fish growth.

The State must strictly implement a protocol regulating dredging and construction work to not disrupt the fish ecosystems. The construction of culverts must be made compulsory on roads across streams so as not to disrupt the migration of fishes. Kerala needs a massive replenishment off the natural stock of inland fishes through stock enhancement and other scientific management measures. There must be periodic dredging of water bodies to clear and widen channels before the seasonal breeding migrations. Better protection of tropical mangroves also enhances safe breeding and nursery grounds for fish.

Climate variability. Climate variability is a threat to marine fisheries through rising sea surface temperatures, ocean acidification, shifting ocean currents, and sea-level rises. In Kerala, the marine fisheries sector is increasingly experiencing the impact of climate change, such as reduced fish catch, fewer fishing days, and damage to fishing equipment and coastal livelihoods. For example, one study reported a 46 per cent decline in fishing days in 2017 following Cyclone Ockhi compared to the previous year. As fishing communities already face socio-economic vulnerabilities, the additional impact of climate variabilities are likely to exacerbate their hardships.

Inland fisheries are equally vulnerable to temperature fluctuations, erratic rainfall, and declining water availability. Droughts, floods, and altered river flows driven by changing monsoon patterns disrupt freshwater fish habitats and breeding cycles. For instance, Kuttanad and the Kole lands, which are ideal for paddy-cum-fish cultures, lie below mean sea level and are highly prone to recurrent flooding. During heavy monsoons, water levels often rise to 4 feet above the existing embankments, resulting in significant crop and aquaculture losses. Frequent floods have severely damaged the state's freshwater ecosystems, with the full extent of the damage yet to be assessed.

Developing climate-resilient fisheries strategies can help fishers adapt to changing conditions. Kerala must adopt a multi-pronged approach combining ecological conservation, livelihood diversification, infrastructure resilience, and policy reforms to safeguard its fisheries sector from climate change. As marine fisheries are more prone to climate variabilities, increased focus must be provided to fish production in brackish waters and freshwater aquaculture. In addition to addressing the issues of resource depletion and sustainability mentioned above, a set of strategic interventions must be devised towards better adaptation. First, the State needs better early warning systems and disaster preparedness. To protect fishers from increasing risks due to sudden storms and rough seas, weather forecasting and mobile alerts for fishermen must be strengthened. Also, appropriate insurance and disaster relief measures must be discussed to reduce the economic losses of fishers due to climate shocks.

Secondly, climate adaptation requires higher investment in fisheries research. Existing research policies are not adequately linked to long-term climate risks. There is also a lack of scientific data required for evidence-based adaptation strategies. Climate adaptive fisheries research will include efforts to develop heat-resistant fish breeds, among others. Adaptation measures must also be integrated with the policy on marine fisheries as well as the activities and projects of LSGs.

Fishers must also diversify their income sources by engaging in aquaculture, mariculture, and eco-tourism activities. These alternative income streams can reduce dependency on wild fisheries. But freshwater aquaculture is largely limited to carp culture in private ponds and small-scale prawn-rice farming in regions like Kuttanad. Innovative approaches such as cold-water fish culture, culture of native species, cage and pen farming, and freshwater pearl production have potential, but are not popular. Such diversification is also part of the larger strategy of climate adaptation.

Harbours and infrastructure facilities

Being highly perishable and prone to losses, fish requires careful handling from harvest to consumption. In the marine sector, losses are often linked to traditional fishing methods, inadequate onboard practices, lack of proper infrastructure at landing centres and fishing harbours, and unsustainable gears. The fisheries sector is estimated to lose around 15 per cent of the harvest due to insufficient post-harvest facilities.

To ensure quality and reduce losses, specialised infrastructure such as cold storages, assembly yards, refrigerated transport, and efficient distribution systems are needed. India's fish industry uses only 1 per cent of the country's total cold storage capacity, and three-fourths of fish are fresh. To improve efficiency and inclusivity, innovative and cost-effective transportation and storage facilities are needed. Addressing these gaps is critical for improving the fisheries value chain.

The lack of adequate facilities at landing centres and fishing harbours limits the sector's capacity to fully utilise marine resources, expand market access, and enhance value addition. Between 2016-17 and 2023-24, the fishing harbours in Manjeswaram, Koyilandi, Tanur, and Vellayil were commissioned. The construction of new fishing harbours in Parappanangadi, Chetthi, and Arthungal are in progress, and are expected to be commissioned by 2026. Work on three other harbours in Pozhiyur, Muthalappozhi and Kasargode have been initiated. In addition, the renovation and modernisation of various existing fishing harbours were also initiated and are in various stages of completion.

Key interventions and an actionable plan to address these challenges include:

- Establishment of chilled storage, ice plants, freezing/processing units, and cold chains at harbours and landing centres.
- Development of hygienic wholesale and retail fish markets with supporting road and transport systems.
- Building efficient logistics systems linking landing centres to markets for uninterrupted supply.
- Introduction of real-time Market Price Information Systems (MPIS) for better price discovery.
- Design and execution of standardised infrastructure models for improved operational efficiency.
- Creation of integrated processing hubs near primary production areas to boost packaging and export capabilities.
- Encouragement to joint investment of both private and public in upgrading roads, ports, and storage facilities.
- Deployment of refrigerated and insulated vehicles, containers, and vessels to preserve fish quality.
- Training of logistics personnel in handling perishable goods to minimise losses during transportation.
- Setting up hubs near key harbours to streamline distribution and reduce delays.
- Facilitation of infrastructure for live seafood transport to improve producer margins and product quality.
- Connection of minor landing sites with insulated trucks and containers to manage peak season landings efficiently.

Fishing harbours must also be climate-proof. Climate-proofing in harbours must integrate engineering resilience, ecological safeguards, and community-centric planning. Harbours must be prioritised based on potential risks, and more investment must flow into improving harbours facing higher risks. Elevated jetties, breakwaters, flood resistant materials, modular floating docks, and better drainage and silt management are all a part of the required interventions. Where possible, mangrove and sea grass restoration along harbour boundaries can act as bio-shields against rough seas. Artificial reefs to dissipate wave energy and beach nourishment with sand dunes are also potential interventions. Power supply to harbours, in lighting, cold storage, and other emergency activities, could be

based on solar power. Improved insurance schemes for boats and harbour infrastructure must also be explored.

The inland fisheries sector is also constrained by inadequate infrastructure for pre-production and production activities, limited development of ponds and hatcheries, poor availability of quality fish seed and feed, weak input delivery mechanisms, and an inefficient monitoring system.

Lack of value-added products

Modernisation is needed in fishing vessels, processing fish products, marketing, and value addition. A major issue in seafood trading is low diversification in terms of products and export destinations. About 90 per cent of exports undergo primary processing, with only 10 per cent forming high-end value-added forms, such as Ready-to-Eat products. This leads to lower value.

The same is the case with culture fisheries.Most freshwater fish are marketed as whole, without any processing. There is little diversification into value-added products, such as fish fillets or surimi. One major hindrance to value addition is the presence of numerous small floating bones in carp flesh.

Closely related is the underutilisation of fish byproducts. Fish offers scope for different byproducts being used in pharmaceutical, nutraceutical, cosmetics and agricultural industries. Some such examples are fish oil, chitin, glucosamine, fish gelatine, peptides, collagen, collagen peptide, hyaluronic acid, fish amino acid for foliar spray, and seaweed-based industries (though Kerala is not rich in sea weeds).

Equally importantly, fisheries and aquaculture sectors face a significant skill gap due to limited technical knowledge among fishers and the complexity of modern technologies. Entrepreneurs play a crucial role in bridging this gap by driving innovation across the value chain- from input production to processing and marketing. Fostering entrepreneurship is key to boosting productivity, ensuring food and nutritional security, increasing returns for fishers, and doubling exports. Recent years have seen a rise in entrepreneurship driven by better education, business skills, and risk-taking ability. Promoting micro, small, and medium enterprises (MSMEs) and ensuring inclusion of women and youth can further strengthen the sector. Their participation in activities like input supply, value addition, and fish product marketing is essential for a resilient, inclusive, and modernised fisheries ecosystem.

Other issues

Another major constraint in the fish industry is a shortage of skilled manpower to cope with advanced processing operations and value addition. There is an acute shortage of certified and trained machine operators, production supervisors, purchase supervisors, expert graders, fish fillers and tuna grade checkers. Personnel involved in the post-harvest seafood supply chain should be properly trained on responsible handling practices to minimise post-harvest losses and ensure the availability of quality and safe seafood to consumers.

There is the absence of a strong quality assurance system in fisheries sector, which is characterised by weak enforcement of regulations and poor consumer confidence in fish consumption. There are reports of lacing of fish with harmful chemicals. This necessitates a strong quality assurance system across the entire fish value chain. Bringing in a traceability system in fisheries would help to improve the consumer confidence in the domestic and international markets for the fish.

Unlike the marine fisheries sector, where institutions such as the Central Marine Fisheries Research Institute (CMFRI) and the Marine Products Export Development Authority (MPEDA) regularly collect and maintain data on fish landings and exports, the inland fisheries sector suffers from a significant lack of reliable data. Inland fishing activities, which are often dispersed and informal, lack centralised monitoring mechanisms, resulting in poor documentation of catch volumes, species composition, and economic value. This deficiency hampers effective policy formulation, scientific management, and investment planning.

Value Addition and Export in Fisheries

Kerala has historically maintained a strong presence in global seafood markets. It is the third-largest seafood-exporting State by quantity and the second-largest seafood-exporting State by value. Its fish processing industry is the backbone of its fisheries sector with 204 registered exporters, accounting for 21 per cent of India's processing units and 14 per cent of the national processing capacity. Kerala also fares better than India in terms of processing and value addition of fish; if only 22 per cent of fish produced in India is processed, 34 per cent of fish produced in Kerala is processed. Among the product categories, frozen fish accounts for about 26 per cent of the total fish products, followed by salted dry fish at 22.3 per cent and unsorted dried fish at 5.7 per cent.

Trends in growth

The State exports a wide variety of marine and inland fish products in fresh, frozen, live, and processed forms. The export earnings from fish products grew significantly in the recent years. From Rs 4,644 crore

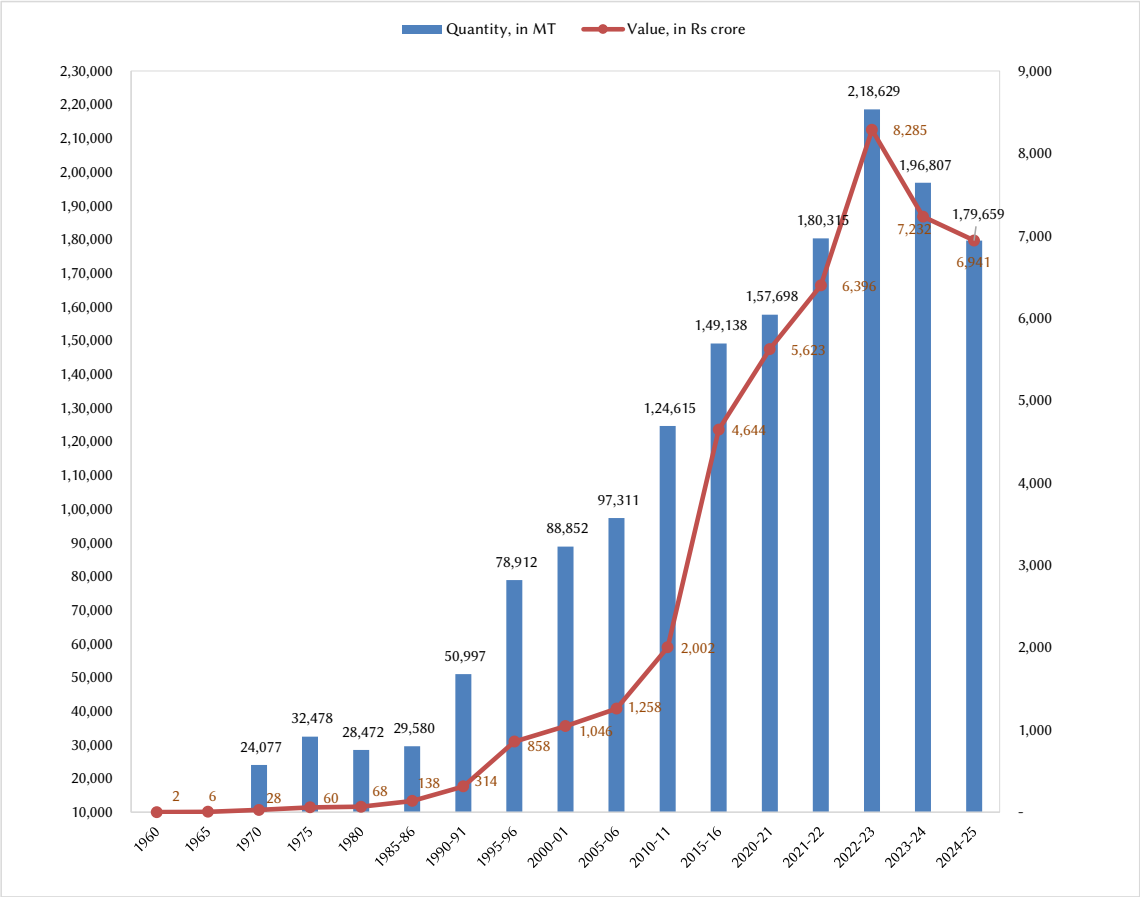


Figure 13.16 *Export of fish products from Kerala, 1960 to 2025* in MT and Rs crore
Source: Kerala State Planning Board

in 2015-16, export earnings grew by about 49.5 per cent to reach Rs 6,941 crore in 2024-25 (Figure 13.16). Export volumes grew by about 20.5 per cent during the same period, touching the 2 lakh MT mark in 2022-23. Kerala has consistently accounted for 12-14 per cent of India's total seafood exports, highlighting its competitiveness in high-demand species like prawns and sardines. The State has also diversified its export destinations to include Southeast Asia and the West Asia, while also expanding its product portfolio to value-added fillets and ready-to-eat seafood items. The fisheries sector remains a cornerstone of Kerala's food processing industry and a vital source of revenue for the State Government, contributing nearly 3 per cent to the State's economy.

In an achievement, Kerala today outperforms the national average in seafood processing and value addition, contributing approximately 34 per cent of India's processed seafood exports. Within the export categories, frozen fish accounts for 26 per cent, followed by salted dried fish (22.3 per cent) and unsalted dried fish (5.7 per cent). However, a heavy reliance on wild-caught shrimp and limited growth in aquaculture continues to constrain Kerala's export potential. The 2019 U.S. ban on wild-caught shrimp imports from India, due to non-compliance with Turtle Excluder Device (TED) standards, was also a constraint on Kerala's marine exports. But Kerala was quick to respond to the ban; in 2019, the State Government made the use of TED (developed by ICAR-CIFT) mandatory in all trawl nets and began awareness programmes on the need to protect marine turtles. Yet, challenges remain including the potential threat of new animals being added to the list, such as sharks.

Constraints and the ways ahead

While the State Government has supported the fish processing sector through various promotional schemes, challenges persist, particularly in ensuring compliance with international standards and modernising infrastructure. A major challenge in the sector is the inconsistency in raw material supply, which has led to low levels of capacity utilisation (less than 20 per cent in

many factories). Lower fish catch from capture fisheries is an important contributing factor here. Hence, the benefits of revival of aquatic ecosystems, increase in production and upgradation of fishing techniques, discussed earlier, would spill over into consistent raw material supplies in the fish processing sector also.

Another important constraint is the low level of diversification in seafood trading in terms of products and export destinations. About 90 per cent of the total fish exports happen at the primary processing stage i.e., live, fresh, chilled, or frozen. Consequently, value realisation is poor. To address this concern, Kerala must encourage entrepreneurship on a large scale in the production and marketing of highly value-added fishery products. Introduction of new fishing vessels which onboard processing facilities in high-value species (including tuna), establishment of industries for indigenisation of processing and packaging machinery, and the organisation of international seafood trade shows will help in drawing new investments into diversification.

The seafood processing sector is dependent on the availability of pre-processing facilities. Many pre-processing facilities in Kerala do not have sufficient infrastructure to maintain high standards of hygiene and hence are in a state of decline. In addition, shortage of these facilities and units in harbours and landing centres also lead to poor quality raw material for factories. It is required that policy focuses on the establishment of new pre-processing facilities and the renovation of existing pre-processing facilities. The redesign of existing harbours, must expressly include facilities for modern and hygienic pre-processing facilities alongside supply of good quality water and ice and effluent treatment units.

Finally, the development of new markets and reform of existing marketing institutions are necessary for further growth in fish processing. The Department of Fisheries established new markets for fish in Nedumankavu, Nooranad and several other locations. New fish markets were also established in Kozhikode and Aluva. Further, the Matsyafed took initiatives to establish new fish net factories. The first fishnet factory was established by Matsyafed in 1985, and its capacity has been incrementally expanded to about 1,250 tonnes, which is about 40 per cent of Kerala's total requirement of fishnets. To cover the deficit, over the years, two other fishnet factories were established in Ernakulam and Kannur. Yet, the deficit persisted. Hence, a fourth fishnet factory was established in Thiruvananthapuram in 2017 with an annual capacity of 450 tonnes.

But more is needed. Cooperatives like Matsyafed must establish more seafood processing factories in Kerala to expand the size of the domestic market. KINFRA has already established several food parks and a seafood park in Aroor in an area of 4.5 acres. More such parks may be needed as the sector grows. New and large cold storages will be required in the Kochi port and the new Vizhinjam port. These ports must also plan to reach efficiency levels in turnaround times of containers, learning from best practices in global ports. A new financial assistance scheme for fish processing may be explored.

Several measures have already been undertaken to ensure ease of doing business by the State Government. In the recent future, more measures must be undertaken to smoothen the issue of "no objection certificates" when existing factories located near residential areas attempt to expand capacities. Improved coordination between the Departments of Industries and Revenue will go a long way to improve the regulatory ecosystem.

Kerala must also attract investment in the establishment of by-product industries in fisheries. About 60 per cent of the raw materials used in processing is categorised as "waste", which currently are transferred into landfills. Bioconversion of this waste in an environmentally sustainable manner is a profitable option. Technologies are available to convert these raw materials into high value by-products, such as fish meal, fish oil, fertilisers, and hydrolysates gelatine. However, growth in this sector requires facilities for aggregation, sorting, labelling, and storage of waste material. In consultation with the Pollution Control Board, Provisions can be streamlined for the establishment of common effluent treatment units. Funds available for waste management could also be utilised here drawing on technologies available from public research institutes like CIFT.

Social Security for Marine Fishers

An overview

Since the 1980s, attention has been paid to welfare of fishers. The establishment of Matsyafed in 1984 and the Kerala Fishermen Welfare Fund Board (KFWFB, or the Matsya Board) in 1985 led to the introduction of several protective, preventive, and promotional social security measures. The Matsya Board, like other welfare fund boards, was a tripartite arrangement where the Government, the employers, and the workers contributed to a fund. In 1993, Kerala became the first State to publish a fisheries policy. With the decentralisation of administration from 1996, livelihood

issues of fishers received renewed attention, which were instrumental in improving their human development indicators from the 2000s onwards.

Matsyafed initiated promotional measures for fisheries products. The Matsya Board addressed protective measures for fisher communities, such as death and accident insurance, old age pensions, assistance to cover illnesses including fatal diseases, maternity care and funeral expenses. The Department of Fisheries also initiated a large protective scheme: the Savings-cum-Relief (SRS) scheme. The SRS scheme aimed to provide off-season relief to marine and inland fishers. The beneficiary would contribute Rs 1,500 over six instalments of Rs 250 per month in the six season months. In the initial design, the Central Government and the State Government contributed an equal share of Rs 1,500 each, thus totalling Rs 3,000 together. An aggregated amount of Rs 4,500 was given to the beneficiaries during the remaining six lean months. Relief of Rs 1,500 was given in each of the lean months of May, June and July for marine fishers and July, August and September for inland fishers.

According to an expert group of the State Planning Board, about 98 per cent of the social protection coverage for fishers and allied workers in Kerala are in the form of protective measures, and the remaining 2 per cent is for preventive measures, such as family welfare, and education.

There was a significant increase in the annual social protection payments to fisher and allied workers between 2015-16 and 2023-24, from Rs 77 crore to Rs 94 crore or by 22 per cent. Data in Table 13.10 shows a substantial expansion of social protection coverage for fisher and allied workers in Kerala over the last decade.

In addition, the Society for Assistance to Fisherwomen (SAF) supports fishery schools and implements welfare schemes funded by the Union Government.

New measures: Expansion and deepening

Between 2016 and 2021, and between 2021 and 2025, social security measures for the fishers were substantially expanded and strengthened. These measures encompassed new areas that were not covered earlier and deepened existing measures to include new sections of people and new types of assistance.

Punargeham. The most important intervention was in housing. A key challenge in the coastal areas has historically been the threat to shelters due to coastal erosion and extreme climate events. The scheme Punargeham was designed as a new initiative in 2019-20 to identify all fisher families living within 50 m of the coast and voluntarily resettle them to safer areas through the construction of apartment complexes and/or houses and also providing them with financial assistance. Resettlement is carried out through the construction of individual houses, apartments built by beneficiaries by forming residence groups, and flat complexes constructed on government/private land acquired for the purpose. The maximum financial assistance provided to a beneficiary under the scheme is Rs 10 lakh.

Across Kerala, 12,304 households were identified as those to be resettled in the first phase. Among them,

Table 13.10 *Amount of social protection payments to fisher and allied workers by the Matsya Board, Kerala, 2015-16 and 2023-24* in Rs crore

Item of payment/assistance	2015-16			2023-24		
	Fisher workers	Allied Workers	Total	Fisher workers	Allied Workers	Total
Pension payments	23.6	7.8	31.4	37.9	12.7	50.7
Family welfare payments	32.5	0.2	32.6	16.1	0.7	16.8
Life and health insurance claims	3.9	1.4	5.3	11.2	1.9	13.0
Death and accident payments	5.8	0.3	6.2	11.4	0.7	12.1
Hospital and illness payments	1.0	0.1	1.1	1.0	0.0	1.1
Education payments	0.1	0.0	0.1	0.1	0.0	0.1
Discretionary payments	0.0	0.0	0.0	0.5	0.0	0.5
Total payments	66.9	9.8	76.7	78.2	16.0	94.3

Source: Matsya Board

9,104 households expressed willingness to relocate as of July 2025. Among them, 4,432 households have identified land and received necessary approvals. Among them, 3,857 households have completed the registration of land plots, and 2,528 households have completed the construction of houses. House construction is yet to begin for 554 households, while 775 houses are in various stages of construction. Thus, a total of 2,918 households has either received flats/houses or have fully received the assistance for house construction. Another 1,136 flats are currently in various stages of construction. It is expected that the rehabilitation of the remaining 3,721 households will also be completed by 2026.

Vidyatheeram. The Vidyatheeram scheme was initiated to provide educational assistance to the children of fisher households. The scheme is premised on the necessity of higher education for the next generation in fisher households to enable them to secure livelihoods and become empowered. A key initiative under the scheme is to provide residential training to students to prepare for medical entrance examinations. Between 2015-16 and 2023-24, a total of 264 students received admissions for different professional. An important gain was that 97 students received admission for MBBS courses.

Another scheme called Thozhiltheeram was initiated, in collaboration with the Kerala Knowledge Economy Mission, to take the benefits of Kerala's transformation into a knowledge society to the coastal villages. The objective was to create, through skilling, at least one job in every fisher household outside the fisheries sector. The scheme is being implemented in nine Districts, and a total of 39,752 persons have registered till July 2025.

Through yet another scheme, students from fisher households who have passed Class 7 were selected and admitted to ten residential fisheries technical high schools, with free food and lodging, to prepare them better for Class 10 exams. In addition to normal subjects, they were also taught subjects in coastal navigation, fishnet production, fabrication, and workshop training. Also, the Kerala State Coastal Development Corporation contributed Rs 52 crore to improve infrastructural facilities in 50 Government and aided schools in the coastal regions.

Ensuring sea safety. Ensuring safety of fishers in the sea was attempted through a variety of measures. To begin with, wearing a life jacket was made compulsory in the sea and about 40,000 life jackets were freely distributed to fishers across the State. Youth from fisher families were selected and trained to form sea safety squads; till 2024-25, close to 719 youth have completed their training and 180 among them have been appointed into the squads. About 1,500 advanced communication equipment, linked to satellites of the ISRO and manufactured by KELTRON, were distributed with a subsidy. Three marine ambulances were purchased and put into action in the seas. The distribution of Fiberglass Reinforced Plastic (FRP) vessels is listed below. Close to 15,150 vessels have been covered under an insurance scheme, where the Government contributes 90 per cent of the premium.

An insurance scheme for accidents in the sea was first initiated in 1987. The insurance benefit for fishers who die or go missing in fishing accidents was increased from Rs 5 lakh in 2016 to Rs 10 lakh in 2025. This payment of Rs 20 lakh is mobilised through a policy of Rs 10 lakh via the Matsya Board and another policy of Rs 10 lakh via the Matsyafed. The premium of the insurance scheme via the Matsya Board is fully borne by the State Government. These benefits, in addition to a funeral allowance of Rs 2,500, are provided to direct fishers as well as allied. The limit for disabilities during accidents was raised to Rs 5 lakh. An educational allowance was also introduced to two children of the deceased fish workers at the rate of Rs 5,000 per child.

Most fishers used to employ unsafe plywood vessels for fishing. Since these vessels were prone to accidents, a special scheme was introduced to provide safer FRP vessels in the place of plywood vessels. Up to 2025, close to 520 FRP fishing vessels were distributed to fishers with subsidy assistance. In addition, loans were granted to fishers through Matsyafed to acquire safer FRP vessels. In the past, fishers found it difficult to repair damaged vessels and engines. To address this issue, all traditional fishing vessels were covered by insurance, where the government paid 90 per cent of the premium.

Coastal Protection

Over the past few decades, Kerala's coastline has come under increasing threat from coastal erosion, a phenomenon where land is gradually worn away by the sea. While coastal erosion was always a natural, cyclical process, its intensity and frequency have sharply escalated in the recent years. This has led to the loss of land, destruction of homes and livelihoods, damage to infrastructure, and displacement of vulnerable communities, particularly those dependent on traditional fishing.

The problem of coastal erosion in Kerala must be viewed through the lens of global climate change, which has significantly amplified the region's vulnerabilities. Rising sea levels, intensified storm surges, unpredictable monsoon patterns, and increased wave activity are directly linked to climate-induced changes in the Arabian Sea. In this context, coastal erosion in Kerala is not merely an environmental concern but a socio-economic and humanitarian crisis, demanding integrated, climate-sensitive responses from both policymakers and local communities.

To address the concern of coastal erosion in a comprehensive and sustainable fashion, Kerala has relied till now on funding from KIIFB. At the same time, it has been negotiating two externally aided projects in this field: the Asian Development Bank-funded Kerala Sustainable Coastal Protection and Climate Resilience Planning Project, and the World Bank-funded Additional Financing for Resilient Kerala Program – Coastal Protection Project (Phase II). All these interventions are managed by the Department of Water Resources.

Kerala has a total costal length of 576 km across eight Districts. Of this, 370 km is protected, 200 km is unprotected, and 6 km passes through restricted area. Out of the protected coastal length of 370 km, 206 km is estimated as stable. Of the remaining 164 km considered as unstable, 78 km need urgent reformation while the remaining requires only minor maintenance.

The State Government aims to ensure sustainable management of the coastal areas; ensure coastal protection and stability; improve coastal resilience; and enhance institutional capacity for shoreline management. The essential physical activity, in the first stage, is to undertake ten coastal protection sub-projects in hotspots. These infrastructural works will primarily entail construction or rehabilitation of seawalls, establishment of nature-based solutions, implement beach nourishment, and construct offshore sand retention structures. The tetrapod seawall in Chellanam, constructed along a 7.3 km length, helped significantly reduce the impact of coastal erosion and protect the shoreline. The project was completed using 20,250 tetrapods and 3.5 lakh MT of granite blocks. This first phase of the project was completed in January 2025 with a funding of Rs 346 crore from KIIFB. The second phase of the project, covering another 6.1 km in Chellanam will begin in 2025. The estimated cost is Rs 358 crore.

The intervention in Chellanam was successful in providing relief to the residents. Tetrapods, with their interlocking, tetrahedral shape, are designed to absorb and dissipate the force of incoming waves and reduce or minimise erosion.

The need for ICZM

It is important that all interventions to address coastal erosion in Kerala broadly follow the framework and principles of Integrated Coastal Zone Management (ICZM). ICZM involves the preparation of management plans for coastal zones that are integrated with developmental, environmental and social goals. They must be developed with the participation of coastal communities. The overall goal must be to preserve, protect, develop, enhance, and restore the coastal resources. Any ICZM strategy should contain an assessment of shoreline changes; resilient measures for mitigating impacts of climate change and high-intensity cyclones; protection of ecologically sensitive areas like mangroves and mud flats; monitoring and abatement of coastal and marine pollution; conservation of coastal and marine bio-resources; and improvement of the livelihoods of coastal communities.

An ICZM strategy must begin with two initial activities. First, there is a need to undertake a regional coastal process study for the Kerala coast, which will help to have a detailed database on coastal processes required for coastal management. This includes study of near-shore bathymetry, waves, and breaker waves, currents, shoreline orientation, wind, sediment characteristics, beach characteristics and sediment inflows. Secondly, there must be a mapping of coastal morphology including beach availability and coastal ecosystems to plan ecosystem-based solutions. There must be a realistic mapping of the Kerala coast demarcating vulnerable coastal stretches, coasts with sufficient beach width, the coasts where the beach is gradually depleting and mudbank coasts. Assessments of the functional and structural performance of the existing coastal protection measures ongoing for the last 70 years and more are necessary.

From these two initial exercises, beach management plans must emerge. Land use and drainage mapping followed with land use and drainage management plans must be prepared. The locations for soft and hard measures of coastal protection must be identified. In cases where hard measures are required, an inventory must be prepared on the sustainable availability of materials suited for coastal protection measures like granite, sand, and other alternate materials.

To ensure social inclusion and livelihood protection, settlement plans must be prepared and implemented for coastal fishing villages considering their long-term housing and socioeconomic needs with the provision for basic services like sanitation, safety, and disaster preparedness as envisaged in CRZ notification. These plans must involve a stock assessment survey and a need assessment survey. This will help to considerably reduce the impacts of erosion on coastal livelihoods.

In sum, proposals to address coastal erosion must be broad-based in orientation, inter-disciplinary in methodology, and participative in implementation.

The Issues in Deep Sea Mining

The potential

India's offshore is an important source of renewable energy, biofuel, valuable and precious metals, and fish and other marine organisms including seaweeds. Scientific initiatives and technological advancements in these areas have led to the emergence of the concept of a "blue economy".

Generating new knowledge on the resource potential and risks in the utilisation of marine resources is a pre-requisite for the growth and development of the blue economy.

India has rich deposits of placer minerals, ilmenite, rutile, garnet, zircon, kyanite, sillimanite, monazite and magnetite on the Kerala, Tamil Nadu, Andhra Pradesh, Odisha and Maharashtra coasts, and nearshore regions. The ocean also contains vast resources of mineral deposits, such as polymetallic nodules, polymetallic sulphides and ferro-manganese crusts.

The externalities and concerns

At the same time, the coasts off Kerala are also rich in biodiversity, including commercially valuable fish species that are crucial for ensuring the livelihood of millions of fishers. The biodiversity contributes to the broader marine food web. Any dredging activity in this ecologically sensitive area could have devastating effects. It could endanger marine species, disrupt habitats, and cause irreversible damage to the marine ecosystem.

These externalities have evoked apprehensions within the fishing community, particularly small-scale fishers who primarily depend on fisheries for their livelihood. It is anticipated that that offshore mining could adversely affect fishing activities and the livelihood of small-scale fishers, reduce the already dwindling marine fish catch, and endanger fish security among Kerala's fish-eating population. Further, offshore mining could lead to different kinds of pollution in marine ecology and habitats. This could include water pollution, sound pollution, increase in water temperature, sea-bed disturbance, and the destruction of marine fauna and flora. Offshore mining could also lead to release and emission of entrapped and poisonous gases from the seabed, endangering the lives of marine organisms, including marine mammals, fishes and microbes. Increased turbidity could affect the photosynthesis in marine waters and the primary production.

These impacts could also transcend to the connected waterbodies including lakes and estuaries. The ecological changes could disturb the livelihoods in, and fisheries-based economy of, coastal and low-lying areas of Kerala, and add to their existing vulnerabilities. Additionally, coastal erosion could worsen due to changes in sand drifting patterns, further destabilising shorelines and endangering nearby communities. For example, the Kollam Parappu holds cultural and ecological significance for coastal communities. It is not merely a resource for extraction but a vital ecosystem that must be preserved for future generations.

Recent legal reforms

The Offshore Areas Mineral (Development and Regulation) Act, 2002 (henceforth the OAMDR Act, 2002) was amended by the Union Government in 2023. Important changes were the addition of the feature of auction as a mode for granting operating rights to private players in offshore mining; a substantial increase in the period of production lease to 50 years; and an increase in the area/extent of lease.

These critical changes have raised the concerns of fishers regarding their implications on fishing activities and their livelihoods.

The way forward

Addressing the concerns of fishers, including designing a comprehensive compensation programme, is of crucial importance in assuring inclusiveness and for sustainable development.

Four important steps are necessary as Kerala engages with the Union Government and manoeuvres through the new national regulations on offshore mining.

- There is need for a detailed geological, geophysical and bathymetric survey of the EEZ. A detailed assessment of the seabed of the continental shelf must also be undertaken. The availability of cobalt and nickel in the high seas needs to be explored, and exploration rights must be obtained from ISA.
- *Ecological implications.* As the coastal zone is vulnerable to multiple hazards, an assessment of coastal vulnerability to understand the risks

involved is necessary. An institutional framework for implementing activities related to the blue economy must be set up so that investments in building infrastructure, developing human resources, and setting up of a governance system shall pay dividends for future generations and ensure sustainability.

- Concerns of the fisher community must be comprehensively addressed. The ex-ante impacts of off-shore mining must be assessed and studied. The concerns of the fishers must be allayed, including through the development of a comprehensive compensation package for fishers.
- Development of an effective communication system with various stakeholders, including policy makers and fishers, about the scope of the development and its various trade-offs should be established.

Any implementation of the amended Act must be halted until a thorough consensus is achieved on the matter across all the stakeholders, and most primarily the fisher households.

Way Forward

Kerala's fisheries sector stands at a significant turning point, shaped by both achievements and emerging challenges. Recent years have seen notable growth in marine and inland fish production, contributing to fisher livelihoods and overall food security. However, this success story is now intersecting with a new set of complexities, particularly as Kerala grapples with climate change and new national amendments that govern offshore mining. These changes have heightened the concerns of fishers, who worry about the potential ramifications for their fishing activities, income, and way of life. In this context, addressing their apprehensions and ensuring their interests are protected through robust, inclusive policies has become more important than ever. In this context, strengthening of social protection and the institution of a comprehensive and universal social security system for the fisher population must be the most prominent agenda item for future State governments.

Moving forward, Kerala's ability to navigate changes and secure long-term, sustainable development for its fisheries sector will demand concerted action on several fronts. While marine resources have reached near-optimal exploitation levels, the vast potential of inland aquaculture remains underutilised. Unlocking this potential requires not only infrastructural and technological upgrades but also an integrated approach that emphasises ecological sustainability, climate resilience, and convergence with allied sectors like agriculture. Strengthening institutional support, promoting regional collaboration, and actively involving local communities in co-management will be key to ensuring that Kerala's fisheries continue to provide food security, livelihoods, and cultural identity in the future. To sustain and enhance export performance, Kerala must also prioritise upgrading its seafood processing facilities and strengthening the fisheries value chain.

By focusing on these multidimensional strategies and ensuring consensus among all stakeholders, especially the fisher households, Kerala can chart a path toward a resilient, inclusive, and sustainable future for its fisheries sector.

Irrigation Development in Kerala

Reforms in the sphere of water resources over the past decade have led to new vigour and a new direction in the management of water in Kerala. Considerable progress was achieved in commissioning and completing long-pending large and medium irrigation projects. New dam and reservoir management protocols were put in place. Policies and plans created new ground for the expansion of micro-irrigation and the practice of integrated water resources management. Special packages were designed and implemented for regions such as Kuttanad, where the scientific management of water is closely linked to household livelihoods and physical safety.

Kerala has an average annual rainfall of 2,884 mm, characterised by two monsoons which contribute about 65 per cent and 20 per cent of the annual rainfall. Thus, water is a significant natural resource in Kerala, and development and management linked to the unique interconnected aquatic ecosystem, is a great challenge. Kerala has 44 rivers, of which, four are classified as medium rivers under national norms, and the rest are minor ones with basin areas less than 2,000 sq.km. The average annual yield from within Kerala, from all the river basins of the State, is estimated to be about 70,000 million cubic meters, and the utilisable yield is about 40,000 million cubic meters. This is much less than the yield of a single river such as Godavari.

A major challenge is that Kerala can utilise less than 10 per cent of the total yield from the rivers for irrigation. Neighbouring States including Tamil Nadu utilise practically all the water available to them in the Cauvery basin. Kerala Development Report 2021 list significant factors affecting irrigation. These include spatial and temporal variation in water availability; growing population and changes in water demand pattern; new and varied needs for the development

activities; absence of effective water stakeholder partnership; and limitations of organisational and procedural mechanisms.

Present Status of Irrigation

The net irrigated area in Kerala increased from 4.1 lakh ha in 2015-16 to 4.4 lakh ha in 2024-25. The irrigation pattern in Kerala is distinctly different from that at the national level. Across States, wells are the most important source of irrigation, contributing to about 65 per cent of the net irrigated area. As per the classification of source-wise distribution of net irrigated area followed by the Ministry of Agriculture and Farmers' Welfare, other sources are the most important component of irrigation in Kerala. Other categories as per this classification in include canals (Government and private), tanks, and wells (tube wells and other wells). The area irrigated by all sources fell except those categorised as "other sources", which rose from 1.1 lakh ha in 2015-16 to 1.8 lakh ha in 2024-25. This is an increase in contribution to the net area irrigated from 26 per cent to 43 per cent.

To better understand the growth in the "other sources" of irrigation, we attempt a different classification of sources. In this classification of different sources by the State's Department of Economics and Statistics, bore well irrigation is not included in wells, but in "other sources". Table 13.11 shows that bore well irrigation, pump irrigation, and a variety of other groundwater sources were mainly responsible for the overall increase in net irrigated area in Kerala between 2015-16 and 2024-25. Over this period, the net area irrigated by bore wells rose by 31,352 ha, by pumps rose by 4,463 ha, and by other methods by 19,315 ha.

The increase in the number of bore wells and pumps may give rise to the impression that the nature of water use has turned unsustainable. However, this is not the case in Kerala. The substantial amount of rainfall received in the State (2,884 mm annually), as well as the continuous adoption of policies of groundwater augmentation and conservation have not just ensured sustainable groundwater use, but have even resulted in an improvement in the total annual groundwater recharge and the overall quantity of annual extractable groundwater resources. In 2024, recharge from rainfall contributed to about 82 per cent of the total annual groundwater recharge. The total annual groundwater recharge in Kerala was assessed as 5.67 BCM, of which, 5.13 BCM was the extractable groundwater resource, but the annual groundwater extraction in 2024 was only 2.76 BCM, or 53.8 per cent.

Consequently, the expansion of borewells or other groundwater resources did not constitute an immediate threat to sustainable water use. Out of the 152 assessment units or blocks in Kerala, only three units

Table 13.11 *Source-wise distribution of net irrigated area, Kerala, 2011-12 to 2024-25* in ha

Source	Type of source	Net irrigated area (ha)		Change, 2015-16 to 2024-25
		2015-16	2024-25	
Small stream thodu)	Government	88,817	78,923	-9,893
	Private	774	445	-329
Pond	Government	1,604	409	-1,195
	Private	46,855	48,899	+2,044
Well	Government	216	109	-107
	Private	1,33,313	1,27,984	-5,329
Borewell	-	35,091	66,443	+31,352
Lift and MI	-	6,297	5,195	-1,102
Others	Pump	19,231	23,694	+4,463
	Other methods	42,219	61,534	+19,315
Other sources	-	39,416	24,642	-14,774
Total		4,13,833	4,38,278	+24,445

Source: Department of Economics and Statistics, GoK

were classified as critical in 2024 i.e., where the stage of groundwater extraction was between 90 per cent and 100 per cent. Of the rest, 29 units were classified as semi-critical (70 per cent to 90 per cent), and 120 units were classified as safe (less than 70 per cent). The same was true in terms of area too. The three critical units were in Chittur and Malampuzha blocks in Palakkad and the Kasaragod block in Kasaragod District. In these units, the criticality was owing to the inherent characteristics of crystalline aquifers.

Irrigation Development in the Past Decade

From the 1950s, the development of major and medium irrigation projects was a priority of the Government of Kerala. Apart from their major role of catering to irrigation requirements, multiple purposes were served by these projects that included hydropower generation, flood mitigation, groundwater recharge, drinking water provision, canal bund roads, and artificial aquatic ecosystem creation for biodiversity, fisheries and tourism. However, many canal projects were delayed for a variety of reasons including delay in land acquisition and lack of funding.

One major focus of the State Government in the last decade has been to complete the ongoing major and medium irrigation projects on a war footing. The State Planning Board constituted a Technical Committee in 2017 to review four long-pending major and medium irrigation projects: Muvattupuzha Valley Irrigation Project (MVIP), Idamalayar Irrigation Project (IIP), Karapuzha Irrigation Project (KIP), and Banasura Sagar Irrigation Project (BSP). The major terms of reference of the Committee were to categorise the projects into three: completion of the project with additional funding; closure of project with minimum budgetary support; and complete closure of works/components. As the Committee was also to suggest sources of finance for completion, and a monitoring mechanism for the time-bound completion of identified works.

Muvattupuzha Valley Irrigation Project (MVIP)

MVIP utilises tailrace discharge from the Moolamattom powerhouse of the Idukki hydroelectric project and the dependable runoff from catchments of the Thodupuzha river. The work of MVIP which had commenced in 1974, was successfully commissioned in July 2020. Its right bank main canal covers 28.3 km, and the left bank main canal covers 37.1 km, in addition to 57.2 km of branch canals and 213 km of distributaries. Only two minor works remain: the Edayar distributary and a few reaches of the Piravom branch canal.

As on the date of commissioning, 12,684 ha of area were irrigated through the MVIP, and drinking water facilities were provided to 6.8 lakh persons. The cumulative expenditure incurred for the project was Rs 1,153 crore, of which only Rs 155 crore was central assistance. Apart from the irrigation of crops, MVIP helps in desalination of low-level paddy fields in Kottayam District and benefits drinking water supply schemes of Idukki, Ernakulam, and Kottayam Districts. It also helps in enhancing the ground water levels of nearby wells. MVIP also helps generate 10.5 MW of hydel power.

Karapuzha Irrigation Project (KIP)

The Cauvery Water Disputes Tribunal awarded a total of 30 TMC of Cauvery water to Kerala, out of which 2.8 TMC was from Karapuzha. Due to the non-completion of the KIP, Kerala was unable to fully utilise the 2.8 TMC of water that belonged to it.

There was significant progress in the completion of KIP between 2017 and 2025. The work on the main dam was completed. At present, capacity of the reservoir is 34.297 cu.mm of water. There is also a 15 MLD drinking water project at the reservoir, which currently supplies water to Kalpetta Municipality and Meenangadi Panchayat. Presently, there is a plan to expand the reservoir to the full reservoir level (FRL) by acquiring an additional 8.1 ha of land. After the expansion, the reservoir's capacity would almost double to 76.5 cu.mm of water. This will also allow new drinking water projects to be commissioned from the KIP to benefit villages like Meppadi, Moopainad, Noolpuzha, and Muttil, as well as parts of Sultan Bathery Municipality.

Significantly, the works on the Right Bank Main Canal were completed to the full length of 8.8 km and the Left Bank Main Canal to the full length of 16.7 km. In addition, 20.01 km of branch canals were completed, which currently provides water over 11.3 km. Further, 2.1 km of distributaries were completed, where water is presently provided along the Arimunda distributary. The action plan to commission KIP envisages the completion of five more distributaries (the land for which has already been acquired) by December 2026. The total project cost of KIP, including salaries and other expenses, has been Rs 394.7 crore.

Banasura Sagar Irrigation Project (BSP)

The situation in BSP was unsatisfactory in 2016. No water had been supplied through the project because construction of the main canal had not

Figure 13.17 *A snapshot of the progress in regularly delivering water under the Karapuzha Irrigation Project before 2016, between 2016 and 2026, and after 2026, Kerala*
Source: Department of Water Resources
Note: This figure does not represent the completion of civil works, but regular supply of water

been completed. A section of the main canal between 1,130 m and 1,500 m remained incomplete due to an ongoing legal dispute.

After 2017, constructive measures were adopted to resolve the legal issues and restart construction in the main canal. Presently, work on over 25.5 km of the full 27.3 km length of the main canal is complete, and the main canal will be fully operational in the financial year 2025-26. The two distributaries from the main canal, Kappukunnu and Peral, are partly complete. About 27.7 km of the Venniyode branch canal is ready, as is about 3.8 km of the Padinjarathara branch canal. Once the main canal is complete, water could be supplied over a significant extent of these branch canals and distributaries. If completed as per the master plan, four more distributaries– Veettikkamoola, Kurumbala East, Venniyode and Kuppadithara, will also be complete and BSP can be commissioned in 2027-28.

Idamalayar Irrigation Project (IIP)

The work on IIP main canal that originates from the right side of the Bhoothathankettu barrage and runs for about 32.3 km is complete. The main canal then bifurcates into a Low Level Canal (LLC) and a Link Canal. The work on the LLC, which had to be cut short due to the construction of the airport at Nedumbassery, was fully completed between 2017 and 2021. The plans to provide water from the LLC using Ductile Iron pipes to the Wapalassery paddy fields in Nedumbassery Panchayat and the Pannikuzhalal paddy field in Angamaly Municipality are near completion.

Work on the Link Canal remains incomplete for several reasons. The 7.5 km Link Canal was designed to connect the main canal of the IIP with the Chalakudy Left Bank Canal (CLBC), which forms part of the Chalakudy River Diversion Scheme (CRDS). Under the Parambikulam–Aliyar Project (PAP), the Government of Tamil Nadu is required to supply Kerala with 12.3 TMC ft of water annually from the Sholayar River reservoir. However, for many years, the Government of Tamil Nadu has not released the stipulated quantity of water into the Kerala Sholayar reservoir, with annual releases remaining below 3 TMC ft.

As a result, CRDS has been underperforming, as adequate amounts of water are not available to feed both the Chalakudy Left Bank Canal (CLBC) and the Chalakudy Right Bank Canal (CRBC). A

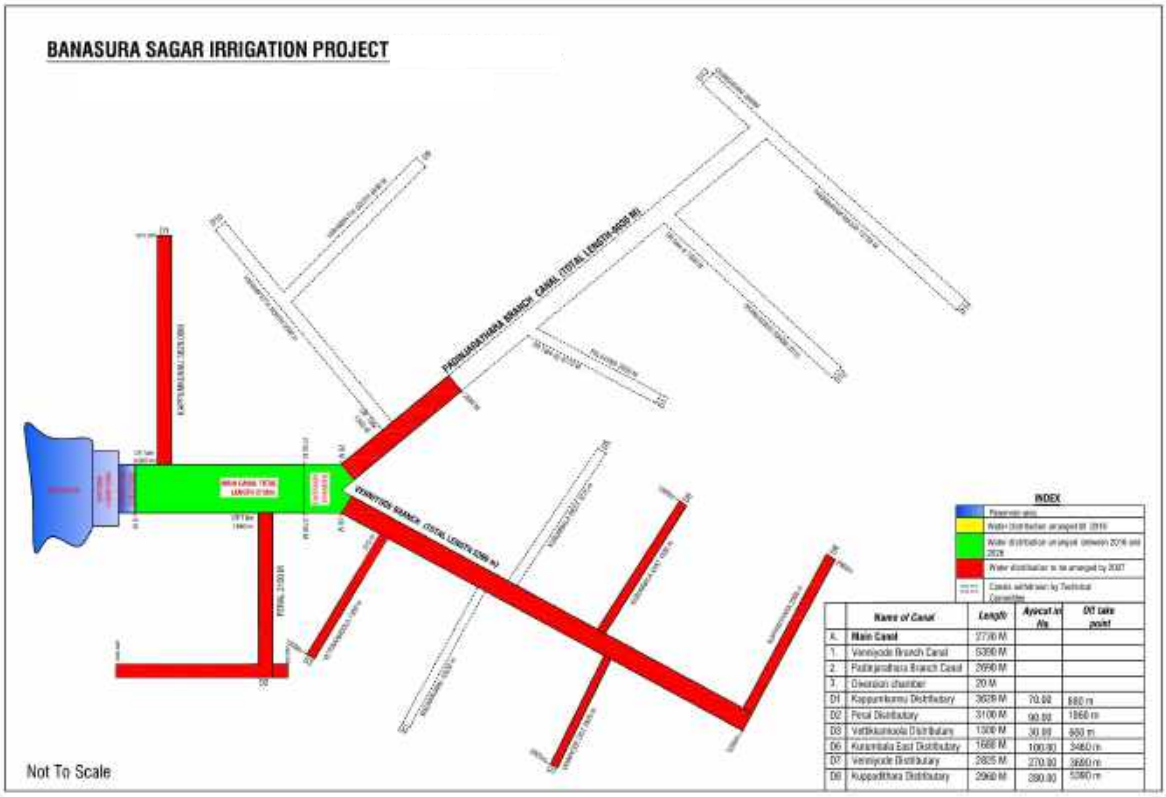


Figure 13.18 *A snapshot of the progress in regularly delivering water under the Banasura Sagar Irrigation Project before 2016, between 2016 and 2026, and after 2026, Kerala*

Source: Department of Water Resources
Note: This figure does not represent the completion of civil works, but regular supply of water

supplementary source is necessary so that the Sholayar water can be fully utilised to meet the needs of the CRBC and the needs of the CLBC can be met from water transferred from the Link Canal of the IIP.

The Technical Committee has provided certain alternative suggestions to convey water from the Periyar to the Chalakudy basin, which could overcome the constraints in the original design and ensure smooth gravity flow. These suggestions are being implemented, and it will be possible to complete the works in the Link Canal by 2026-27.

Pazhassi Irrigation Project

Another irrigation project that was pending completion was the Pazhassi project. From 2018-19, concerted efforts were made to hasten the completion of work, and a total amount of Rs 66.2 crore was spent from various sources to modernise and rehabilitate the canal systems. Significantly, the first trial run of the main canal was successfully conducted in April 2022. The second trial run of the main canal was conducted in March 2023.

The third phase further extended water flow up to 42.5 km of the main canal beyond the Parassinikkadavu aqueduct and 16.6 km in the Mahe branch canal till Elangode. Water was also successfully distributed through associated field bodies such as Vengad, Kurumbukkal, and Mangattidam at various locations, and distributaries like Patyam, Vallai, and Mokeri. Thus, for the first time ever, water was supplied over 51 days in 2024, from January 31, 2024 till March 30, 2024. In 2025, water was supplied in the canals from January 6, 2025 till February 16, 2025. The rapid completion of work in the Pazhassi project enabled the recharge of nearby wells (approximately 1,600 wells and 300 ponds) and irrigation of more than 1,200 ha of paddy fields, mainly in the Thariyeri, Perumachery, and Naniyoor Panchayats. The remaining work is expected to be completed in 2026, when the project will be ready for recommissioning.

Pattissery Irrigation Project

The construction of the Pattissery dam, intended to use 0.075 TMC of water from the Cauvery award to Kerala, is part of the Chengalar scheme in the Pambar basin. It is located in the Kanthallur village in Idukki. The project consists of a 140-metre-long and

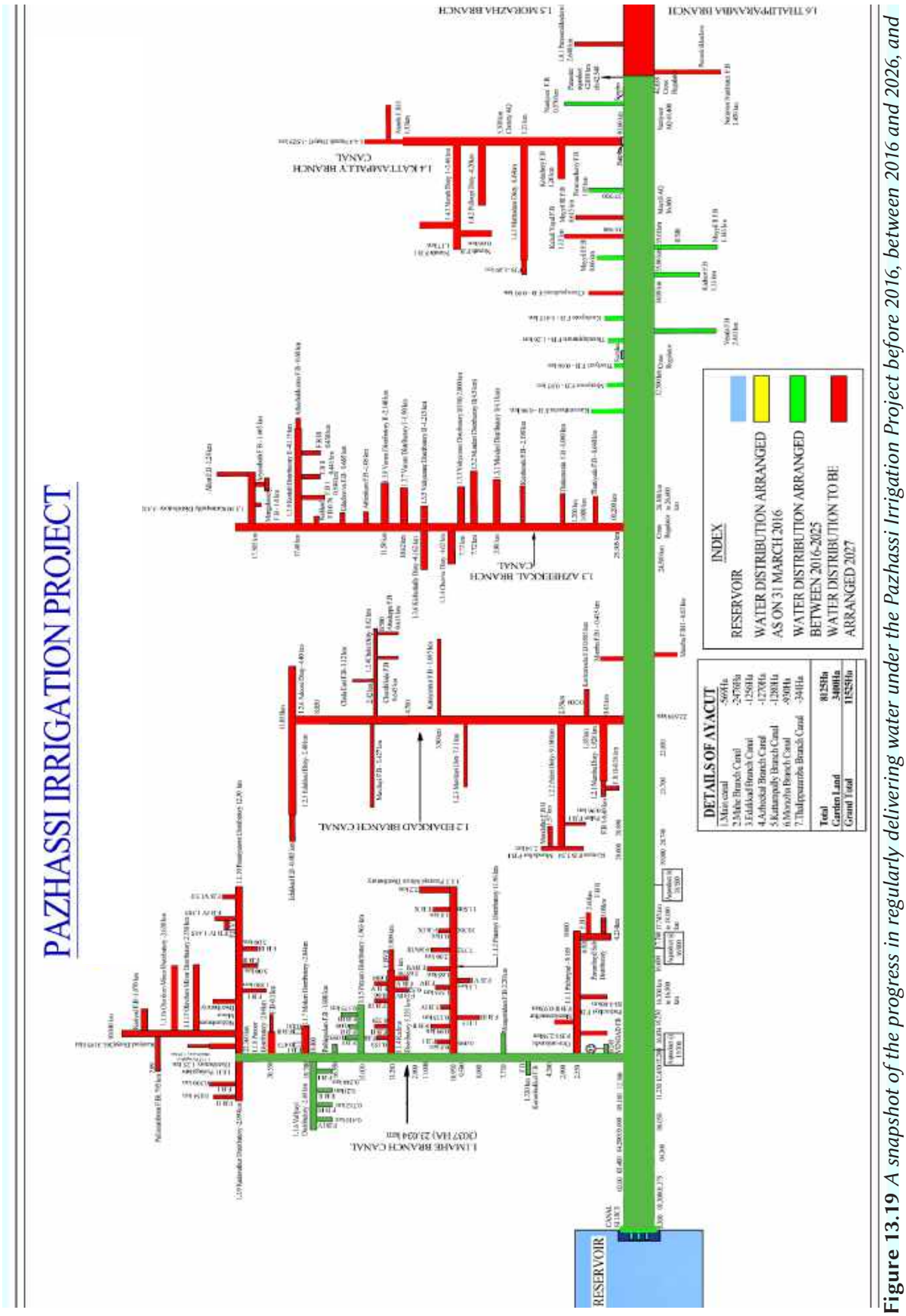


Figure 13.19 *A snapshot of the progress in regularly delivering water under the Pazhassi Irrigation Project before 2016, between 2016 and 2026, and after 2026, Kerala*

Source: Department of Water Resources

Note: This figure does not represent the completion of civil works, but regular supply of water

Table 13.12 *Details of micro-irrigation schemes, by stage, Kerala, 2016-17 to 2024-25*

Project location	Amount (Rs crore)	Ayacut area (acres)	Number of farmers	Crops benefited	Status
Karadipara, Palakkad	3.1	171	54	Coconut, Fodder grass, Arecanut	Completed
Moongilmada, Palakkad	6.8	305	86	Coconut, Fodder grass, Arecanut	Completed
Valiyeri, Palakkad	3.9	262	68	Coconut, Fodder grass, Arecanut, Banana	Completed
Navithankulam, Palakkad	3	125	36	Coconut, Fodder grass	Completed
Kunnamkattupathy, Palakkad	5.2	305	97	Coconut, Fodder grass, Mango	Completed
Athichal Mundenkolli, Wayanad	2.7	124	102	Coffee, Vegetables, Pepper	Completed
Pazhayannur, Thrissur	2	74	32	Arecanut, Nutmeg, Coconut	Ongoing
Thirumarady, Ernakulam	5.3	150	45	Nutmeg, Dragon Fruit, Banana, Coconut	Ongoing
Seethathode, Pathanamthitta	2.9	46	36	Pepper, Cardamom	Ongoing
Vandamedu, Idukki	3.1	55	44	Nutmeg, Cardamom	Ongoing
Kanjiramoozhi, Kozhikode	5.1	196	108	Coconut, Banana, Arecanut, Pineapple	Ongoing
Kamakshi -1, Idukki	3.2	47	60	Cardamom	Ongoing
Kamakshi -2, Idukki	2	40	30	Cardamom	Ongoing
Calvary Mount, Idukki	9.9	140	120	Pepper, Cardamom	Ongoing

Source: KIIDC; Department of Water Resources

Notes: Three other projects are also in the process of being implemented by KIIDC using KIIFB funds: at Chinnar, Idukki (120 acres); Seminaripadi, Idukki (57 acres); and Chittur, Palakkad (6219 acres).

33.2-metre-high check dam, along with a 160-metre-long saddle dam, and small canals on the left and right banks. It is intended to supply irrigation water to crops grown in Kanthallur and Keezhanthur. Administrative sanction for the dam was given in March 2013, but the construction was unduly delayed for technical and financial reasons. Special attention given to the construction of the dam under the 14th Plan ensured that 80.4 per cent of the civil works, 48 per cent of the instrumentation work and 52 per cent of the mechanical work of the dam were completed by 2025.

Micro-irrigation

The shift from conventional to micro-irrigation methods is critical for the future of Kerala's agriculture. Drip and sprinkler systems are key components of micro-irrigation, allowing precise control over water delivery. The potential for adopting micro-irrigation in Kerala is not limited to a specific crop or region but over a wide variety of crops from paddy to horticultural crops to plantations. In 2024, the State Government initiated the KM Mani Community Micro-Irrigation Scheme. The objective was to develop large and the contiguous

plots that used micro-irrigation and functioned as demonstration plots for farmers.

The Kerala Irrigation Infrastructure Development Corporation (KIIDC) was entrusted with implementation of the scheme. Contractors were selected through competitive bids from empanelled companies. The list of beneficiaries was prepared by forming a Water Users' Association of willing farmers. After completion, necessary training was also provided to the farmers, and the operational expenses of the project were borne by the respective water users' associations. KIIDC was entrusted with the establishment of 17 micro-irrigation projects, of which six are already complete and functional (see Table 13.12).

In addition, micro-irrigation projects were initiated by the Department of Water Resources in 2024, and are expected to be completed by 2026-27. These include micro-irrigation schemes at Dasanakkara, Pulpally, Wayanad; Kuruvilangad, Kottayam; and Vazhavatta, Kalpetta, Wayanad.

Watershed development schemes

Important initiatives in watershed development were undertaken under the Haritha Keralam Mission from 2017-18 under three heads: Minor Irrigation Class I - Haritha Keralam; Minor Irrigation Class II – Haritha Keralam; and Renovation of Tanks and Ponds under Haritha Keralam. From 2021, works under Haritha Keralam Mission were continued under Navakeralam Karmapadhathi – II. Under all these heads, detailed watershed plans for 941 Panchayats were prepared. The Mission also collaborated with the Department of Agriculture in the design and execution of community micro-irrigation schemes.

Under Minor Irrigation Class I, minor irrigation work like the construction and improvement of tanks and rivulets, check dams, sluices, regulators, bunds, vented cross bars, saltwater barriers, and drainages that served an area of more than 50 ha to 200 ha were implemented. Under Minor Irrigation Class II, minor irrigation works with an ayacut area less than 50 ha were implemented. These included watershed plans and rejuvenation of water bodies/ponds. Under Renovation of Tanks and Ponds, the Mission undertook renovation and revamping of major existing public/community ponds and linking them with irrigation canals.

Integrated River Basin Conservation and Management

Effective water resource management is a challenge, particularly in regions like Kerala where river systems are under increasing pressure. In Kerala, intense rainfall in the high ranges that cause peak runoffs, combined with the flat terrain towards the western coast, creates conditions conducive for flooding. With the emergence of population pressure, industrialisation, and climate change, an effective and integrated system of water management has become urgent. In 2021, the State Planning Board constituted an expert committee to draft a basic document for the establishment of a River Basin Authority to coordinate and implement water resources projects with the participation of LSGs and other stakeholders. Consequently, in 2025, the State Government established the Kerala River Basin Conservation and Management Authority chaired by the Chief Minister. The objective was to formulate and implement Integrated River Basin Management Plans for each river basin.

The proposed Authority would provide a structured approach to Integrated Water Resource Management (IWRM) in Kerala. It would prepare a framework that outlines governance structures, planning methodologies, financial management, and community engagement strategies. It would ensure collaboration among Government agencies, local communities, civil society, and the private sector, ensuring that all stakeholders work together towards sustainable river basin management. Committees at different levels will be established with defined responsibilities and tasks, which will ensure efficiency in the flow of data, information, decisions and actions.

Addressing floods and extreme events

There was no scientific operation policy for irrigation reservoirs in Kerala till 2018. Following the floods of 2018, with, a committee was constituted to examine the causes of repeated extreme heavy rainfall events and their consequences. The Committee analysed flood inundation for various scenarios of different reservoir levels and rainfall for the Periyar river basin and developed possible flood inundation maps. The possibilities for containing flood waters, though limited quantity, were probed. The report suggested providing dynamic flood cushion in the conservation zones below the FRL for all reservoirs, though these reservoirs were originally designed for conserving water for irrigation. The Department of Water Resources came out with reservoir operation policies, which considerably helped in mitigating floods in the subsequent years.

The Committee also pointed out several natural and anthropogenic drivers for floods in Kerala, among which the prominent were: high-intensity rainfall for prolonged duration; human interventions in

Table 13.13 *Utilisation of water by Kerala from the Cauvery basin, 2021-22* in TMC

Classification of utilisation	Kabini sub-basin	Bhavani sub-basin	Pambar sub-basin	All sub-basins
Major irrigation schemes	0	0	0	0
Medium irrigation schemes	2.85	0	0	2.85
Minor irrigation schemes	1.54	0.12	0.31	1.96
Domestic water utilisation	3.63	0.03	0.01	3.66
Industrial water utilisation	0.0005	0	0	0.0005
Total	8.0	0.15	0.31	8.45

Source: Department of Water Resources

the catchment areas, particularly in the floodplains and riparian zones; unauthorised encroachments; reclamation of wetlands and lakes; unexpected extreme rainfall events and lack of expertise in handling them through reservoir operations; and decreased channel capacities due to sedimentation and aquatic vegetation. The State Government coordinated across different departments and agencies to investigate and take appropriate actions, including data collection and modelling. Several recommendations of the Committee are being implemented in flood-prone areas. The Government also initiated actions to plan for structural and non-structural measures to mitigate hydrologic extremes, since statistical data also pointed to frequent dry periods in the State.

Recognising the importance of rice cultivation in the Vembanad wetland in Kuttanad, the second Kuttanad Package formulated by the State Planning Board was sanctioned, and the Government of Kerala implemented it after 2019.

In 2024, the State Planning Board appointed another expert committee to prepare a master plan for the development and efficient management of water resources in Kerala. This Committee recommended interventions and/or projects to enhance irrigation and mitigating floods; to fully utilise the 30 TMC of water allocated to Kerala sub-basins of the Cauvery by the Cauvery Water Disputes Tribunal before 2030; and create storage structures to meet the requirements of summer months and mitigating floods. The Committee also prepared an estimate of the costs to complete these projects and interventions and suggest sources for mobilising funds. The Third Water Policy document for Kerala is in its final stage for adoption.

Infrastructure Development for Irrigation

The future irrigation strategy of Kerala must focus on efficient water management and utilisation for agriculture considering the State's unique geographical, climatic, social, economic, environmental, and institutional features. The strategy would also need to consider the features and needs of the State's water resources and agricultural practices. The State must actively use irrigation to increase productivity of commercial crops, optimise water use in agriculture, develop appropriate irrigation infrastructure, and propagate efficient irrigation techniques to improve water use efficiency and sustainability.

Kerala must target to urgently utilise its full irrigation potential. It is notable that Kerala uses less than 10 per cent of the total surface water potential in the State. Efficiency of irrigation is also less than in the neighbouring States.

Kerala must focus on completing all the ongoing and allocated irrigation projects on war-footing and achieve more reliability and adequacy in irrigation through various governance, infrastructure and on-farm measures. It must also explore the possibilities of new major and medium irrigation projects, wherever needed. Data management systems and application of Industry 4.0 tools, capacity building and stakeholder participation should become integral part of the irrigation management system. Water resources development should also focus on mitigating hydrologic extremes to ensure the smooth conduct of productive

activities in the State and protect human lives and livelihoods. The new storage structures planned for the future should not only focus on irrigation and other conservation requirements but also on flood mitigation.

Infrastructure development in irrigation must focus on two aspects in the immediate future: fully utilising the water awarded to Kerala by the Cauvery River Water Tribunal, and planning for a productive and sustainable use of water given the challlenges of climate variability.

The Cauvery Tribunal allocated the 740 TMC of water in the river in the following proportions: Kerala (30 TMC), Karnataka (270 TMC), Tamil Nadu (419 TMC), and Union Territory of Pondicherry (7 TMC). The 30 TMC to Kerala was for the Kabini sub-basin (21 TMC), Bhavani sub-basin (6 TMC), and Pambar sub-basin (3 TMC). The unutilised water from Kerala's share in the Kabini sub-basin was permitted to be used by Tamil Nadu, till such time that Kerala used its allocated 30 TMC share of water. Across sub-basins, only 8.45 TMC of water was utilised by Kerala till 2022. The extent of unutilised water amounted to 12.99 TMC of water in the Kabini sub-basin, 5.85 TMC of water in the Bhavani sub-basin and 2.69 TMC of water in the Pambar sub-basin. The challenge for Kerala is to substantially increase the total use of water from the Cauvery basins to at least 20 TMC of water by 2030.

To fully utilise water-use in the Kabini sub-basin, Kerala must urgently commission the two medium irrigation projects of Karapuzha and Banasura Sagar. There are several other proposed projects in the Kabini sub-basin, which need to be initiated and completed. Similarly, in the Pambar sub-basin, new projects must be initiated and completed, such as the Thalayar irrigation project, Chengalar irrigation project, the Vattavada irrigation project, and the Chambakkad irrigation project. In the Bhavani sub-basin, new projects must be initiated and completed, such as the Kerala Bhavani project, Panthanthodu project, Arali project and the Thudukki project.

In addition, the tailrace from hydroelectric projects should be utilised for irrigation wherever possible. In the future, the State should opt for multi-purpose projects instead of single-sector projects. It should have a single overall plan combining all river basins and implement the projects in a phased manner. In every location, several alternate plans should be available from which an optimal one should be selected. There is also the need to plan for the repair and maintenance of the physical systems periodically. The minor irrigation projects should be, as far as possible, based on local-level water sources like wells, tanks, ponds, abandoned quarries, springs and surangams.

A concerted effort is necessary to effectively implement Participatory Irrigation Management (PIM) in all irrigation projects in Kerala. The constitution and functioning of water users' associations and canal and project committees must be revisited and stakeholder participation improved.

Neighbouring States have adopted Irrigation Management Systems (IMS), which is a combination of tools, technologies, and strategies used to optimise water application for crops, ensure efficient water use and maximise productivity. These systems monitor and control irrigation, delivering the right amount of water at the right time to meet crop needs. Kerala must also establish these systems.

Catchment treatment measures must also be taken up by adopting afforestation, agronomic and structural measures by the agencies concerned to prevent sediment yield and deposition in the reservoirs, wherever necessary and possible. The desilting of existing reservoirs, wherever the deposits have exceeded the dead storage could be taken up, after studying the slope as well as degradation and aggradation within the reservoir without causing any damage to the dam structure.

Shift to Watershed Development

The estimated annual average runoff through the river systems in the State is estimated as 78 BCM. The total live storage capacity of all the reservoirs is only about 7 per cent of the total annual runoff. High surface runoff leads to soil erosion and degradation of agricultural land. Because the percolation of precipitation to groundwater is low, the State also experiences droughts during most post-monsoon months.

In this context, watershed development and management offer a practical and sustainable instrument for scientific management of soil and water. Experiences of successes show that they can contribute to a rise in the water table, reduced periods of drought, and a steady supply of fresh water in the post-monsoon months. They also lead to improved water supply for irrigation, leading in turn to higher yields for crops.

Since the initiation of decentralisation in 1996-97, LSGs were entrusted with the task of implementing watershed projects. More recently, the Haritha Keralam Mission too has also been involved in the process. Many Panchayats developed watershed master plans. Still, except for a few locations such as Kattakkada and Taliparamba, successful models of watershed development could not be developed.

This chapter argues for an intensive reorientation of the Department of Water Resources towards watershed-based planning. The State Planning Board had prepared a blueprint for watershed-based planning in 2022.

At least one model micro watershed must be developed in each of the Districts of Kerala for demonstration through identified Government/ autonomous institutions in the District. There must be a nodal agency at the State-level that ensures convergence across line departments and agencies. The functioning of the Haritha Keralam Mission must be appropriately reoriented to focus primarily on the development of watersheds in active collaboration with the Department of Soil Survey and Soil Conservation.

The Thrust on Micro-Irrigation

Micro-irrigation has steadily grown in India in the last 40 years and is being adapted as an essential component of precision farming. In Kerala, the spread of micro-irrigation is relatively less than in other States. The area under micro-irrigation in Kerala was limited to about 32,900 ha, which was only 0.3 per cent of the total area in India.

Micro-irrigation differs from conventional forms of irrigation in that its design, system components, and operation are crop specific. It is often said that in micro-irrigation, the crop is irrigated and not the land. Thus, in the future, planning must combine precision farming and micro-irrigation.

Most Kerala farmers still consider micro-irrigation as a water conveyance tool and not as a strategy to increase yield or to be integrated with precision farming methods. At the same time, the potential of micro-irrigation to increase the productivity in a spectrum of crops grown in Kerala is significant. Data supplied by experts working with Jain Irrigation Ltd show that productivity can be raised by two to three times if conventional methods are replaced by precision farming methods that combine drip irrigation and fertigation.

The strategy

Any effort to extend micro-irrigation in Kerala requires a strategy with multiple steps: identify crops and regions where the acceptance would be high; intensive field-level engagements with growers on the potential of micro-irrigation to enhance yields; large scale training on the scientific water and fertiliser scheduling; formation of cooperatives and farmer producer companies to adopt the technology on a wide scale; and linking primary producers to value-addition industries.

Kerala must also actively learn from the best practices in other States. Successful States are characterised by adoption in scale and constructive public-private participation. There are also other models that emphasise community control and participation. Case studies of successful projects documented by the State Planning Board include the Shiggaon Integrated Micro-irrigation Project in Haveri district, Karnataka and the Ramthal Project in Bagalkot district, Karnataka. These experiences show that strategies that focus on the integration of micro- irrigation with precision farming practices and fertigation to increase crop yields were more successful than strategies that limited themselves to providing financial support to adoption.

A special purpose entity for micro-irrigation across line departments and focused on an interdisciplinary approach is the need of the hour in Kerala.

Way Forward

Kerala, blessed with abundant rainfall and a dense river network, faces unique challenges in harnessing its water resources. Despite high annual rainfall, only about 10 per cent of the river water is used for irrigation due to geographic, organisational, and policy limitations. Kerala's irrigation landscape differs from the national pattern, relying less on wells and more on alternative sources. The State's irrigated area has seen a modest rise, with growth in the use of borewells and pumps, though overall groundwater extraction remains within sustainable levels.

Major and medium irrigation projects have long gestation periods, often hampered by funding, land acquisition, and stakeholder engagement issues. In the past decade, efforts have focused on completing key projects such as the Muvattupuzha Valley Irrigation Project (MVIP), Karapuzha Irrigation Project (KIP), Banasura Sagar Irrigation Project (BSP), Idamalayar Irrigation Project (IIP), and Pazhassi, which are vital for expanding irrigation and supporting drinking water supplies. Micro-irrigation initiatives were also launched to promote efficient water use. The Government established the Kerala River Basin Conservation and Management Authority to coordinate strategies across basins.

In the future, the State must fully utilise its water allocation from the Cauvery, complete pending projects, and adopt micro-irrigation and precision farming. Kerala must learn from the best practices in other States and prioritise participatory management and modern irrigation technologies. Strengthening watershed-based planning, community involvement, and interdisciplinary collaboration to manage river basins are pathways to a resilient water future for Kerala's agriculture.

Human-Animal Interface: A Mitigation Plan for Kerala

The State of Kerala has a high proportion of total land dedicated to forests; it is also a State renowned for the scientific management of forests. Policies and plans over the last decade consolidated past gains in forest management and created new ground in preserving forest wealth, increasing water security in forests, securing the lives and livelihoods of forest-dependent communities, and developing forests as a safeguard against climate variability. In particular, substantial Plan resources were allocated to the management of human-animal interface in the State. A strong platform has been created that advances science-based strategies to deal with the challenge.

According to the 2023 assessment by the Forest Survey of India (FSI), the recorded forest area of Kerala is 11,522 sq km, accounting for approximately 29.7 per cent of the State's total geographical area. However, the actual forest area, including areas outside reserved forests and individual trees outside forests, is much larger; the total forest cover in Kerala is 22,059 sq km, representing 56.8 per cent of the State's geographical area. This is a steady increase from 19,239 sq km reported by FSI in 2015.

Forests in Kerala are rich in biodiversity, a repository of rare and endangered flora and fauna, and vital for environmental sustainability, and function as an effective carbon sink. Forest categories in Kerala include tropical evergreen forests, tropical moist deciduous forests, dry deciduous forests, scrub forests, shola forests, grasslands, mangrove forests, and plantations, among others. Each of the 44 rivers in the State has its source in a forest.

Kerala's natural forests play a crucial role in maintaining environmental balance and make significant contributions to the State's cultural, ecological, and economic spheres. The Forest Department is responsible for forest and wildlife protection; management of timber and forest produce; management of protected areas; forest boundary survey and conservation of soil and water; biodiversity conservation, research, and education; participatory forest management and tribal welfare; human–wildlife conflict mitigation; legal enforcement and intelligence; and development of forest management information systems. The Department also manages forest plantations, which stand at 1,375 sq km in 2024-25, and make a significant contribution to the State's non-tax revenue.

There are 4,88,386 tribal persons belonging to 37 tribal communities living in 6,578 Unnathis, constituting 1.45 per cent of the total population of the State. A significant proportion of these communities are forest-dependent, making forests in Kerala not only ecological assets but also vital to their socio-economic and cultural well-being. Non-timber forest products constitute the most important means of livelihood and source of income for Scheduled Tribe communities living adjacent to the forests of Kerala. From 2016-17 to 2024-25, 4,467 families were given title deeds for 6,183 acres of land, as per the Forest Rights Act.

While the annually published Economic Reviews and the Kerala Development Report 2021 give a broader view of the forest sector in Kerala, this chapter will focus on human-animal interface.

Human-Animal Interface

Human-Animal Interface (HAI) is increasingly acknowledged as one of the most urgent environmental and social challenges facing Kerala today. Although such conflicts have existed throughout human history, their frequency and intensity continue to rise across countries and landscapes, including in Kerala. The situation is driven by a complex interplay of ecological pressures and human activities that demand nuanced, context-specific interventions.

In Kerala, the Forest Department is actively pursuing a range of strategies to mitigate and manage HAI. However, a number of geographic and ecological factors contribute to the recurring and severe nature of such conflicts in various regions. One of the most affected areas is the Wayanad District, which shares forest boundaries with the States of Karnataka and Tamil Nadu. The eastern slopes of the Western Ghats in these neighbouring States are typically dry and rain-shadowed, while the western slopes, including Wayanad, feature lush evergreen forests with higher moisture and better water availability, even in the peak summer season. Naturally, the wildlife are drawn to such resource-rich zones. During periods of drought or food scarcity, wildlife, particularly herbivores and carnivores, from the drier forests of Karnataka and Tamil Nadu migrate into the more fertile and hospitable forests of Kerala. This seasonal influx significantly increases the wildlife population density, particularly during summer months, intensifying the risk of human-wildlife interactions. Compounding this issue is the fragmentation of natural habitats and corridors due to human settlement expansion and infrastructure development, which disrupts the historical movement routes of wild animals and pushes them closer to human habitations.

Another major contributor to the conflict is the degradation of forest habitats, largely driven by the proliferation of invasive plant species such as Senna spectabilis, Lantana camara, Chromolaena odorata, and Mikania micrantha. These invasives suppress native vegetation, reduce forage availability for herbivores, and disrupt the ecological balance of forest ecosystems. Consequently, wildlife is increasingly compelled to venture beyond forest boundaries in search of food, triggering more frequent conflict scenarios.

Shifting agricultural patterns along forest fringes have further intensified the situation. There is increasing cultivation high-value, water-rich crops such as banana, pineapple, jackfruit, and coconut, which are highly attractive to elephants and other herbivores. These crops act as strong lures, drawing wildlife out of forests and into farmlands, thereby increasing crop-raiding incidents and elevating risks to both human lives and livelihoods.

The key wildlife species contributing to HAI in Kerala include elephants, wild pigs, bonnet macaques, tigers, and leopards, all of which are linked to major impacts such as crop damage, livestock predation, human injuries, and fatalities. Other species like sambar, gaur, and spotted deer also play a significant role in crop depredation, especially in areas adjacent to forests. Snakes represent another serious threat, primarily in non-forested or semi-wild areas, with incidents often resulting in human casualties.

Among these, snakebite incidents stand out as a particularly critical concern. The Health Department reports around 3,000 snakebite cases annually, with nearly 2,000 affecting individuals engaged in MGNREGA projects and those harvesting fodder grass. Targeted interventions to reduce snakebite incidents could, therefore, significantly alleviate the overall burden of HAI in the State.

While high-profile encounters involving elephants, tigers, and leopards tend to dominate public discourse, it is the frequent and persistent conflicts with species like wild pigs and bonnet macaques that generate deep frustration among local communities. These daily challenges may seem minor individually but accumulate over time, leading to substantial economic and psychological stress.

Effectively managing HAI requires an understanding that conflicts manifest differently across diverse landscapes, each necessitating tailored mitigation strategies:

- Forest-edge and tribal areas, often lying within traditional migration corridors of large mammals like elephants and tigers, require community-based interventions that account for traditional knowledge and ensure human safety without harming wildlife.
- Large plantation zones face unique patterns of conflict and call for coordinated responses involving estate management, local governance, and forest officials.

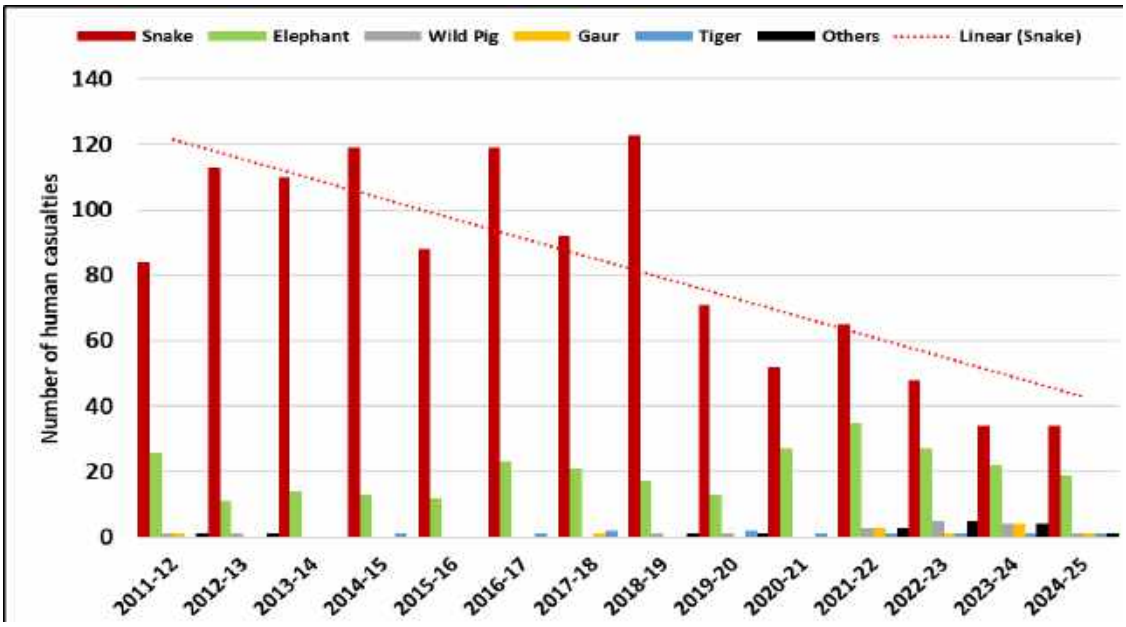


Figure 13.20 *Human mortality due to various species in Kerala, 2011 to 2025*

Source: Kerala Forest Department, GoK

- Rural and agrarian landscapes, dominated by settler populations, are frequently affected by species like wild pigs and bonnet macaques. Locally adapted, practical solutions are essential in these regions to minimise crop losses and promote coexistence.
- Urban and peri-urban areas often report snake and small mammal encounters, requiring quick-response systems and public awareness campaigns to prevent panic and protect public safety.

Given the multifaceted nature of human-wildlife conflict in Kerala, a comprehensive and adaptive approach is essential. This should integrate habitat restoration, corridor protection, responsible land-use planning, and proactive community engagement to ensure that mitigation efforts are targeted, effective, and sustainable.

Conflict scenario and trends: current status

During the period from April 2024 to March 2025, a total of 67 human fatalities were recorded due to HAI in the State. Snakebites account for the highest toll (34), followed by elephant attacks (19), wild pigs (11), and isolated cases involving tigers, gaur, and other species. Importantly, elephant incidents are concentrated within forested areas, primarily affecting tribal communities. This calls for targeted intervention in tribal belts, particularly around elephant habitats.

Time-series data over 14 years shows a declining trend in human fatalities from wildlife interactions across a 14-year span (Figure 13.20). Snakebites consistently top the list, pointing to an endemic issue requiring systemic health interventions such as widespread anti-venom availability and SARPA (Snake Awareness Rescue and Protection App) training programmes. Elephant-related casualties show sporadic spikes, suggesting the effectiveness of temporary mitigation measures but a lack of sustained success. The data reinforces the urgency of a comprehensive and persistent strategy to manage diverse species-related risks, which should consider both ecological and socio-political dimensions.

Disaster declaration and policy

After HAI was officially declared a State-specific disaster in March 2024, the State Government began rolling out structured mitigation measures. This pivotal policy shift allowed for the mobilisation of funds, infrastructure, and administrative machinery toward a focused HAI response. By acknowledging the crisis formally, the Government created a legal and institutional space for long-term programming, mainstreaming HAI management into disaster governance, and improving coordination between departments.

The front-end and back-end activities currently being implemented are outlined below.

Front-End Activities

The Kerala Forest Department is presently undertaking a series of short-term or immediate interventions, referred to as front-end measures, with the primary objective of mitigating HAI across the State. These proactive steps are designed to address urgent conflict situations on the ground, improve community safety, and ensure rapid response to wildlife-related incidents.

Strengthening emergency response systems

Subsequent to the declaration of Disaster Declaration, Emergency Operation Centres, including one at the Forest Headquarters and 36 Divisional Forest EOCs were created. Additionally, the integration with the State Disaster Management Authority (SDMA) and a fund allocation of Rs 3.7 crore indicate a cross-departmental approach to conflict management.

Strengthening Rapid Response Teams (RRT)

RRTs in the State undertake a significant workload, carrying out nearly 20,000 wildlife rescue operations each year. Despite their critical role in mitigating human-wildlife conflict, these teams are widely regarded as under-resourced and overstretched. This situation highlights the urgent need to scale up their operational capacity through enhanced recruitment, improved infrastructure, and strengthened logistical support. In response to these challenges, a proposal is currently under implementation aimed at fortifying the capabilities of RRTs across the State, including the the establishment and maintenance of dedicated tool rooms at each RRT unit to ensure ready access to essential equipment. An allocation of Rs10 lakh per RRT has been earmarked to support these enhancements and improve the overall efficiency and responsiveness of the teams. There are 28 RRTs functioning in the State.

Landscape-based conflict management

Kerala has delineated 12 major conflict landscapes, including Wayanad, Nilambur, and Mannarkkad (Figure 13.21). This zonal demarcation reflects a move towards spatially strategic planning. Each landscape is distinct in its species composition, terrain, and socio-economic backdrop. Such zoning allows for localised plans tailored to specific challenges such as elephant corridors in Wayanad, pig raids in Palakkad, or leopard sightings in Munnar. This framework facilitates focused interventions, better monitoring, and resource allocation. The detailed Landscape-level HAI Reduction and Mitigation Plans are prepared and under validation at various levels.

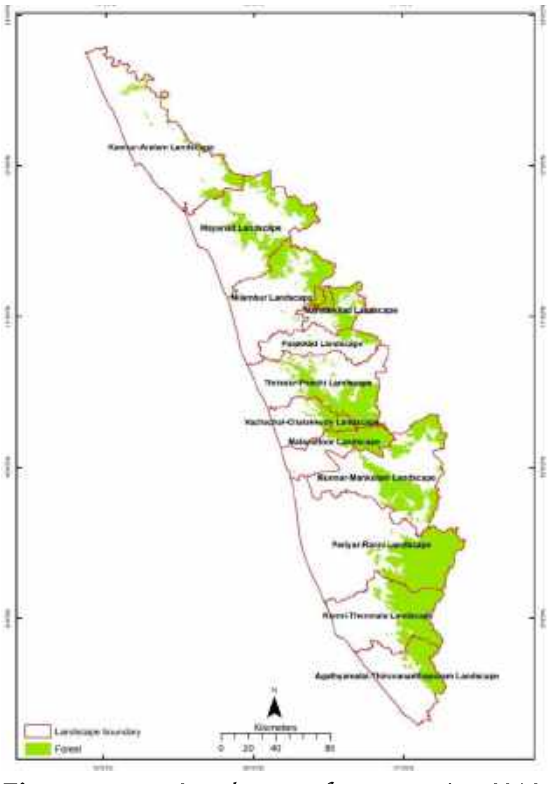


Figure 13.21 *Landscape for managing HAI in Kerala*
Source: Kerala Forest Department, GoK

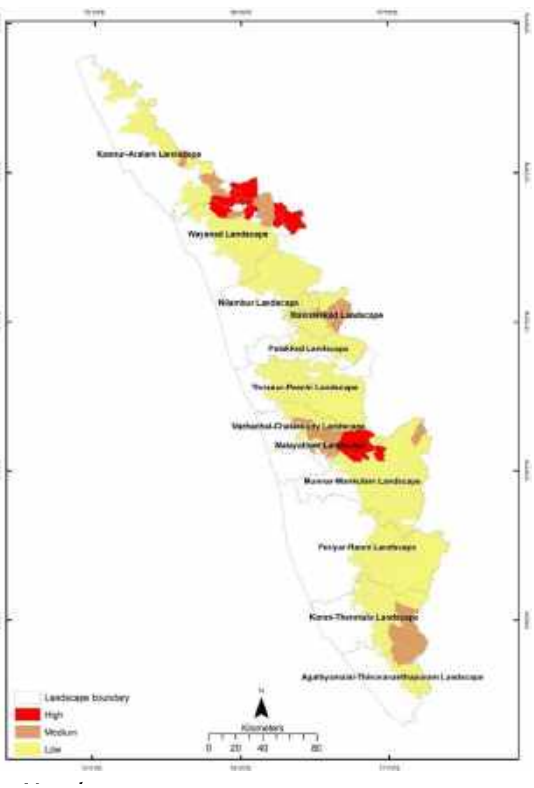


Figure 13.22 *HAI-prone Panchayats in Kerala*
Source: Kerala Forest Department, GoK

Planning for conflict-prone landscapes and Panchayats

HAI poses considerable challenges across Kerala, particularly within the 12 conflict-prone landscapes identified in the State (Figure 13.21). These landscapes span a diverse range of ecological, social, and economic settings, necessitating context-specific mitigation strategies to address the complex interactions between wildlife, human settlements, and agricultural zones. The 12 identified HAI landscapes and their corresponding forest divisions are:

- Kannur–Aralam Landscape: Kasaragod and Kannur Forest Divisions; Aralam and Kottiyur Wildlife Sanctuaries (WLS)
- Wayanad Landscape: Wayanad North and South Forest Divisions; Wayanad Wildlife Sanctuary
- Kozhikode Sub-landscape: Kozhikode Forest Division with Malabar WLS (a separate sub-plan will be prepared and integrated with the Wayanad Landscape Plan)
- Nilambur Landscape: Nilambur North and South Forest Divisions; buffer zone of Silent Valley National Park (NP) and Karimpuzha WLS
- Mannarkkad Landscape: Mannarkkad Forest Division; core zone of Silent Valley NP
- Palakkad Landscape: Palakkad Forest Division
- Thrissur–Peechi Landscape: Thrissur and Nenmara Forest Divisions; Peechi and Chimmony WLSs, Parambikulam Tiger Reserve, and Choolanur Peafowl Sanctuary
- Vazhachal–Chalakkudy Landscape: Vazhachal and Chalakkudy Forest Divisions
- Malayattoor Landscape: Malayattoor Forest Division; Thattekkad Bird Sanctuary
- Munnar–Mankulam Landscape: Marayoor, Munnar, Mankulam, Kothamangalam, and part of Kottayam Forest Divisions; Munnar Wildlife Division and Idukki WLS
- Periyar–Ranni Landscape: Part of Kottayam and Ranni Forest Divisions; Periyar Tiger Reserve
- Konni–Thenmala Landscape: Konni, Achancoil, Punalur, and Thenmala Forest Divisions
- Agasthyamalai–Thiruvananthapuram Landscape: Thiruvananthapuram Forest Division and ABP Special Division; Shendurney, Neyyar, and Peppara WLSs

At the micro level, a total of 273 Panchayats across 75 Assembly Constituencies have been mapped as conflict-prone (see Figure 13.22), with 30 Panchayats identified as being at Very High or High risk. This fine-scale mapping is a crucial step in operationalising the conflict landscape framework. The decentralisation of wildlife governance is evidenced by the intension to formulate Panchayat-specific Landscape-level mitigation plans and a State-level HAI policy. These hyperlocal strategies promote community participation, enable faster response times, and facilitate the integration of traditional and indigenous knowledge systems, especially from tribal communities.

Snakebite reduction: SARPA initiative

SARPA, which began in 2019–20, is a standout example of community participation, especially in addressing snakebite fatalities. With 2,500 trained volunteers and over 50,000 snake rescues, the programme showcases the value of citizen engagement. The push for indigenous antivenom production and anti-venom stock availability in hospitals also ties into public health goals. However, the goal to halve human deaths due to snake bite in two years and eliminate them in five is ambitious and requires robust monitoring and continuous capacity building.

Physical barriers and compensation measures

Out of the total 4,000 km of HAI interface across the State, 1,945 km has been secured with barricades to date. Between 2021 and 2024, an expenditure of Rs 14.4 crore has facilitated the installation of 653.3 km of physical barriers.

To address this challenge, the State has launched the Solar Fencing Mission, aimed at extending protection to vulnerable areas through cost-effective, wildlife-friendly, fencing solutions. This initiative is expected to significantly reduce the frequency of incursions and associated conflict incidents.

Meanwhile, compensation records from the past decade highlight the substantial financial strain that HAI places on the State's exchequer. While the provision of timely compensation remains essential for sustaining public trust and ensuring support for conservation efforts, it must be balanced with proactive, prevention-focused investments. Accordingly, the State is committed to maintaining prompt and adequate compensation for affected individuals, while simultaneously transitioning toward long-term preventive strategies to mitigate conflict and reduce recurring financial liabilities.

Technology integration and community awareness

An integrated approach combining advanced technology and active community participation will be adopted to effectively mitigate HAI. A comprehensive suite of modern tools and systems is being deployed to enhance real-time monitoring, early warning, and rapid response capabilities in conflict-prone areas. Key technological interventions include:

- Deployment of drone squads and AI-based surveillance systems to monitor wildlife movement, particularly in high-risk zones, enabling proactive intervention.
- Installation of thermal sensors and digital signboards to detect animal presence near human settlements and alert local communities in real time.
- Establishment of centralised, real-time monitoring systems for continuous data collection, threat analysis, and coordination of response teams.

On the community engagement front, over 1,000 local WhatsApp groups have already been formed to serve as hyperlocal communication channels for sharing timely alerts and coordinating rescue or deterrent actions. In addition, 280 JSS (Janjagratha Samithis or community vigilance committees) are functioning as grassroots-level watch groups, strengthening community preparedness and response.

Furthermore, surveillance and safety measures are being reinforced through infrastructure projects supported by the Kerala Infrastructure Investment Fund Board (KIIFB). These include the installation of solar-powered streetlights, AI-enabled camera systems, and drones in conflict hotspots to improve visibility, track wildlife movement, and deter animal intrusion during critical hours.

This dual approach, leveraging technology and empowering communities, forms a robust and scalable model for reducing HAI incidents, safeguarding both human lives and wildlife, and building long-term resilience across vulnerable landscapes.

Back-End Activities

Ecological restoration for conflict mitigation

Ecological degradation is one of the root causes of HAI. The creation and rejuvenation of water bodies — 1,434 ponds, 574 wells, 308 earthen ponds, and 90 check dams — aims to improve habitat quality and expected to reduce animal movement into human settlements. Brushwood dams and public participation indicate a nature-based solution model rooted in local stewardship. Conducting these activities in a mission mode (Food, Fodder and Water) shows a clear intent to restore ecological balance and ensure long-term sustainability of conservation efforts.

Fodder development and invasive species control

This plan addresses the dual issue of food scarcity for wildlife and habitat degradation due to invasive species. Activities such as grassland restoration, controlled burning, and planting native species over 1,365 ha reflect proactive habitat management. For this purpose, identification of grasslands, marshy grasslands (*vayals*) and open areas are being identified in the field as part of Food, Fodder and Water Mission. The eradication of Senna spectabilis (400 ha) and Wattle (531 ha), and 3,000 MT of Senna removed under Kerala Paper Products Limited (KPPL), indicates the seriousness of the invasive species threat. Also important is the shift away from monocultures like Acacia and Mangium across 748 ha, returning these areas to more diverse native habitats. These efforts directly influence wildlife movement and foraging patterns and can significantly reduce conflict over time.

Voluntary relocation and welfare

Relocation of communities from deep forest areas, while inherently sensitive, can be a highly effective strategy for mitigating HAI when implemented voluntarily and with adequate support. The Navakiranam initiative exemplifies this approach, with Rs 111 crore sanctioned to relocate 815 families, each receiving Rs 15 lakh along with Rs 25,000 for livelihood assistance. This model ensures the rights and dignity of relocated individuals are upheld, while simultaneously contributing to conservation objectives by allowing wildlife unobstructed access to core habitats. In Wayanad Wildlife Sanctuary, an annual allocation of Rs 9.2 crore over two years has facilitated the relocation of 1,151 families, marking a significant step toward reducing conflict in a high-priority landscape.

This proposal recommends the continuation and strengthening of such voluntary, welfare-oriented, and culturally sensitive relocation efforts. Sustained support, particularly the continued provision of Rs 9.3 crore annually for the next two years, is essential to ensure smooth resettlement and long-term community well-being. Additionally, enhancing post-relocation livelihood support, infrastructure, and social integration mechanisms will reinforce the programme's success. By prioritising participatory processes and maintaining the voluntary nature of relocation, the State can effectively reduce future HAIs and foster coexistence, while restoring vital ecological corridors and wildlife habitats.

Multi-tier monitoring and interstate coordination

Multi-tier monitoring, from the Chief Minister at the State-level to LSG presidents at the local-level, enables accountability and ensures that HAI is treated as a priority across all governance layers. The MoU signed on March 10, 2024 between Kerala, Karnataka, and Tamil Nadu marks a major step forward in addressing transboundary wildlife movement. Coordination in population estimation and information sharing is vital, especially in contiguous forest areas like the Nilgiri Biosphere Reserve. These partnerships can result in synchronised management actions, especially for wide-ranging species such as elephants and tigers.

Legislative reforms

Being a Central Act, the Wildlife Protection Act, 1972 often hampers swift field responses. These decisions will need to balance ecological risks with social demands and should be based on scientific population assessments. The State Government is also planning to come out with appropriate Legislative Amendments in this regard.

Root causes and integrated responses

HAI is driven by a complex set of interrelated factors, including habitat fragmentation, the spread of invasive species, excessive grazing pressures, and developmental intrusions such as tourism and land-use changes. Additionally, climate change further exacerbates these issues. Beyond ecological factors, socio-economic and behavioural aspects, such as farmers engaging in risk-prone activities or the general lack of awareness, also contribute significantly to conflict scenarios. Understanding this comprehensive causality framework is essential for designing well-rounded and effective interventions. Therefore, mitigating HAI necessitates an integrated approach that combines ecological restoration, policy reforms, socio-economic development, and climate resilience strategies in a coordinated and synchronised manner.

Ten missions will operationalise this plan:

- Food, Fodder and Water
- Tribal Knowledge Integration
- Solar Fencing Expansion
- Wild Pig Management. The time-bound order for the culling of wild boars, which pose a threat to human life and property in inhabited areas, has been extended for another year starting May 28, 2025. Panels of authorised shooters have been established at the division and circle levels to carry out systematic culling in conflict-prone areas. Additionally, local governance leaders, including Panchayat Presidents, have been appointed as Honorary Wildlife Wardens, and Panchayat Secretaries as Authorised Officers, to oversee and implement the culling operations under the Wildlife (Protection) Act. On January 14, 2024, the State Legislative Assembly passed a resolution

Box 13.4

Culling and the Stance of the Government of India

The Government in Kerala has adopted a scientific and legally sound approach to HAI. While several structural problems exist, most immediate demand of farmers today concerns permissions to cull wild animals that cause harm. Critics argue that Kerala should simply use its powers under Section 11 of the Wildlife Protection Act to authorise killings. This argument appears simple but is misleading, because the Act, and the Union Government's detailed procedures impose extremely stringent conditions.

Under the Act, animals listed in Schedules I and II cannot be culled except under limited provisions: Sections 11, 12, and 62. Section 11 allows culling a Schedule I animal, such as elephants, tigers, leopards, deer, Bonnet Macaque, and peafowl, only if the Chief Wildlife Warden is convinced, with recorded evidence, that the animal poses a threat to human life, or is incurably diseased, or is severely disabled. Even then, culling is allowed only after proving that capture, immobilisation, or translocation is impossible. Captured animals cannot be kept in captivity unless rehabilitation is impossible and the reasons are fully documented.

Section 62 empowers the Union Government to declare specific wild animals as "vermin" for certain areas and times via a notification, allowing them to be culled despite their protected status. However, no animal from the highest protection Schedules (Schedules I and Part II of Schedule II) can be declared vermin. Section 12 allows the Chief Wildlife Warden to grant permits for culling specific animals for special purposes, like education, scientific research, and scientific management.

Further complexity arises from Union-Government-issued Standard Operating Procedures (SOPs). For tigers or leopards, an expert six-member committee must be formed; camera traps must verify the animal's identity against the national photo repository; detailed research must establish the animal's behaviour and the causes of attacks; traps must be tried first; and then tranquilisation may be attempted. If culling becomes unavoidable, additional protocols, such as camera traps at the kill site, installation of pressure-impression pads, imposition of Section 144 for crowd control, veterinary assessments, radio-collaring healthy animals, and reporting to national authorities, must be followed. Similar procedures exist for elephants.

Even after a Schedule I animal is culled, its carcass becomes government property under Section 39; consumption of its meat is illegal and punishable with imprisonment or fines. Disposal must be through supervised incineration, with no commercial transactions permitted.

These arduous requirements routinely delay permissions for culling. This is why Kerala has sought reforms to the central law and its guidelines. However, the Union Government continues to insist that States continue using Section 11 of the Act as it exists. This, Kerala has argued, is the root of the problem.

For Schedule II animals such as wild boar, restrictions are relatively less rigid. Kerala has already delegated powers to Panchayats to cull crop-destroying wild boar. But Schedule I species, such as Bonnet Macaque, cannot be declared vermin. Kerala, therefore, has demanded that Bonnet Macaque be moved from Schedule I to Schedule II, enabling easier management through Section 62 and a simplification of SOP procedures even under Section 11. The State has also asked for procedural simplifications and greater powers for States to act swiftly when dangerous animals must be culled.

requesting the Union Government to declare wild boars as vermin under Section 62 of the Wildlife (Protection) Act. The State has been actively following up on this issue, including submitting a Memorandum of Requests during a delegation visit in November 2024, led by the Kerala Forest Minister, urging the Union Minister for Environment, Forest, and Climate Change to consider this request (see Box 13.4).

- SARPA (Snake Rescue and Prevention): see Box 13.5
- Bonnet Macaque Management. As part of this Mission, the State of Kerala has formally recommended to the Union Government that the native bonnet macaque (Macaca radiata) be reclassified from Schedule I to Schedule II of the Wildlife (Protection) Act in response to the growing monkey nuisance across various regions. This reclassification would enable regulated population control measures. To address urgent monkey-related conflicts, Rapid Response Teams

Box 13.5

Towards a Snakebite-Free Kerala

The proposed plan for a Snakebite-Free Kerala represents a paradigm shift in addressing human-snake conflict, from reactive rescue missions to proactive community resilience and ecological sensitivity. By combining grassroots action with State-level leadership, Kerala has the potential to set a global benchmark in snakebite management, public health integration, and wildlife conservation.

Despite the presence of sophisticated medical care and trained personnel, deaths caused by snake bites continue due to a combination of poor awareness, delayed responses, traditional beliefs, and incorrect treatments. The coexistence of all the "Big Four" venomous snake species (Spectacled Cobra, Russell's Viper, Common Krait, and Saw-scaled Viper) in Kerala elevates the risk significantly. Therefore, a State-wide coordinated and sustained initiative is essential to address the crisis holistically. The vision of the initiative is to make Kerala the first Indian state to achieve "Zero Snakebite Fatalities" through a multi-stakeholder approach that integrates community participation, medical preparedness, conservation ethics, and real-time technology.

The immediate goal is to reduce snakebite fatalities by 50 per cent within two years, while the long-term goal is to eliminate snakebite deaths entirely within five years. To achieve these goals, the initiative aims to build a data-driven and community-engaged ecosystem to effectively address snakebite incidents, while also strengthening conservation efforts and legal safeguards for snakes in order to balance human safety with ecological ethics. The strategic framework of the initiative is structured around two key pillars: front-end interventions focusing on immediate response measures, and back-end initiatives that emphasise long-term structural and systemic solutions.

The front-end strategies focus on immediate measures to reduce the risk and impact of snakebite incidents through community empowerment and strengthened emergency response systems. These include distributing protective equipment such as gumboots, gloves, and long-handled tools to farmers and other high-risk workers, ensuring the availability of broad-spectrum Anti-Snake Venom (ASV) at all Primary Health Centres (PHCs), and training ASHA workers, community health workers, and first responders in snakebite first aid. The strategy also leverages the SARPA mobile application to enable rapid response, crowd-source rescue data, and support community awareness activities.

The back-end strategies comprise long-term structural measures aimed at creating a sustainable and coordinated ecosystem for snakebite prevention, treatment, and conservation. These include formalising snake rescue and release protocols through the SARPA network of certified rescuers, establishing a State-level venom extraction centre for region-specific Anti-Snake Venom (ASV production), and strengthening capacity building for healthcare providers, forest staff, and volunteers. Recognising snakebite as a notifiable disease will improve surveillance, resource allocation, and treatment standardisation, while institutional collaboration among Forest, Health, Revenue, Education Departments, and Biodiversity Boards, along with State-level media strategies and outreach through school and village-level awareness programmes, will help counter misinformation, highlight successes, amd promote early treatment-seeking behaviour.
All snakes in India are protected under the Wildlife (Protection) Act, 1972, and the initiative reaffirms its strong commitment to conservation by preventing the unnecessary killing of snakes, encouraging safe and scientific rescue practices, and promoting coexistence and ecological awareness through wildlife education in both urban and rural areas.

The expected outcomes of the initiative include a significant reduction in snakebite-related fatalities and long-term disabilities, the creation of empowered and well-prepared communities equipped with scientific knowledge, and the emergence of Kerala as a national leader in snakebite mitigation and urban wildlife management. In addition, the initiative will enable the generation of real-time data and analytical dashboards through the SARPA platform, supporting informed policy formulation and evidence-based programmatic decision-making.

(RRTs) have been deployed to provide immediate support and intervention. Furthermore, a comprehensive action plan, incorporating strategies like birth control, is prepared for submission to the Union Government for approval.

- Real-Time Monitoring
- Primary Response Team Strengthening
- Public Sensitisation
- Knowledge and Data Management

These ongoing missions offer a modular, measurable, and results-driven framework for State-wide implementation.

Monitoring Wildlife in Human-Dominated Landscapes

The following eight species, which are traditionally associated with forested ecosystems, are increasingly being observed in urban, semi-urban, and rural areas across the State: Wild Pig; Bonnet Macaque; Indian Peafowl; Golden Jackal; Malabar Giant Squirrel; Sambar Deer; Barking Deer; and Bats. This noticeable shift in their habitat usage has triggered growing ecological, economic, and public safety concerns. As these species move beyond their natural habitats, they often come into conflict with human activities, prompting the need for a structured and evidence-based approach to monitoring and management.

In response to these emerging challenges, a preliminary and essential step will involve estimating the population of these species outside protected and forested areas. This exercise will be undertaken in collaboration with local governance bodies, including Panchayats, Municipal Corporations, and Biodiversity Management Committees (BMCs) across the State. Data collection using a participatory rapid assessment survey and structured questionnaire is expected to generate baseline data that will inform the design of future management strategies, support conflict mitigation measures, and enhance coexistence between humans and wildlife in increasingly shared spaces.

Strengthening forest veterinary services

A proposal has been submitted to establish a well-organised Forest Veterinary Unit within the Forest Department to address the shortage of qualified veterinary professionals, who play a crucial role in mitigating human-wildlife conflicts. Furthermore, a comprehensive five-year development plan, estimated at Rs 84.3 crore, has been proposed. This plan includes the creation of essential infrastructure, procurement of tranquilising and treatment equipment, development of treatment and holding facilities, and provision of surgical kits, post-mortem tools, and cages.

Landscape-specific priority actions

Each of the 12 identified landscapes will implement custom priority actions, from Senna removal in Wayanad, to swamp restoration in Nilambur, and tourism management in Munnar-Mankulam. Panchayat-wise plans will include night travel regulation, solar fencing maintenance, and real-time monitoring hubs.

Way Forward

Human-animal interface (HAI) in Kerala has emerged as a critical environmental and socio-economic challenge, fuelled by a complex interplay of ecological dynamics, habitat fragmentation, and evolving agricultural practices. The region's unique geography, particularly in districts such as Wayanad and Idukki, with their resource-rich forests bordering Karnataka and Tamil Nadu, intensifies conflict as wildlife migrate during periods of drought and food scarcity. The fragmentation of wildlife corridors due to expanding human settlements and infrastructure projects has further exacerbated these issues, pushing animals into closer contact with people and increasing the frequency and severity of encounters.

This chapter highlighted the need to consider culling of wild animals as an option but also noted its inadequacy as a permanent solution to HAI. Adequate emphasis must also be placed on science-based strategies that include front-end and back-end measures. Front-end measures include fostering community education about wildlife, implementing safe and scientific rescue protocols, and encouraging peaceful co-existence through targeted programmes in both urban and rural contexts. These initiatives aim to create empowered communities that are equipped with practical knowledge and preparedness, thereby significantly reducing incidents such as snakebite fatalities and disabilities. Back-end measures focus on systemic improvements: developing informed wildlife management policies, collecting real-time data through platforms, and leveraging technology to monitor and respond to animal movements.

By integrating scientific education with policy and technological innovation, Kerala positions itself as a national exemplar in wildlife management and snakebite mitigation. The overall argument advocates space for lethal measures but also for non-lethal, evidence-based responses in tackling environmental challenges, aiming for harmonious coexistence that benefits both people and wildlife while addressing the socio-economic complexities of each region.

Chapter 14
Industry:
Navigating New Horizons, Unlocking Entrepreneurship, and Chartering New Paths

Industry in Kerala has been placed on a new trajectory, and a structural change is under way in the economy as a whole. This development in the State's economy is driven by the growth of MSMEs and modern industries, the expansion of industrial infrastructure, higher levels of value addition, a turnaround in the performance of Public Sector Undertakings (PSUs), a surge in major investments, and the modernisation of traditional sectors. The industries started in the State have been designed to suit its strengths, and thus to unlock its potential.

The long-held perception that Kerala is an unfriendly destination for industrial investment has now been firmly laid to rest. The State Government has instilled investor confidence and inspired a strong wave of entrepreneurship among its people. The State has focused on knowledge-driven industries and adopted strategies suited to its strengths, to unlock its immense potential.

Between 2016-17 and 2024-25, the absolute Gross State Value Added (GSVA) (constant prices) of the manufacturing sector has increased from Rs 57,268 crore to Rs 79,204 crore, a (real) growth of about 38 per cent. Kerala's emphasis on enterprise-led development means that significant increase in trade and service activities would be reflected in the tertiary sector and not in the secondary sector. In other words, the current system of capturing value added is an understatement of Kerala's achievements.

Data from the Annual Survey of Industries shows that labour productivity in Kerala, which has historically lagged significantly behind all-India labour productivity, equalled it by 2022-23. The average earnings (emoluments) per employee also show a similar trend (Figure 14.1 and Figure 14.2).

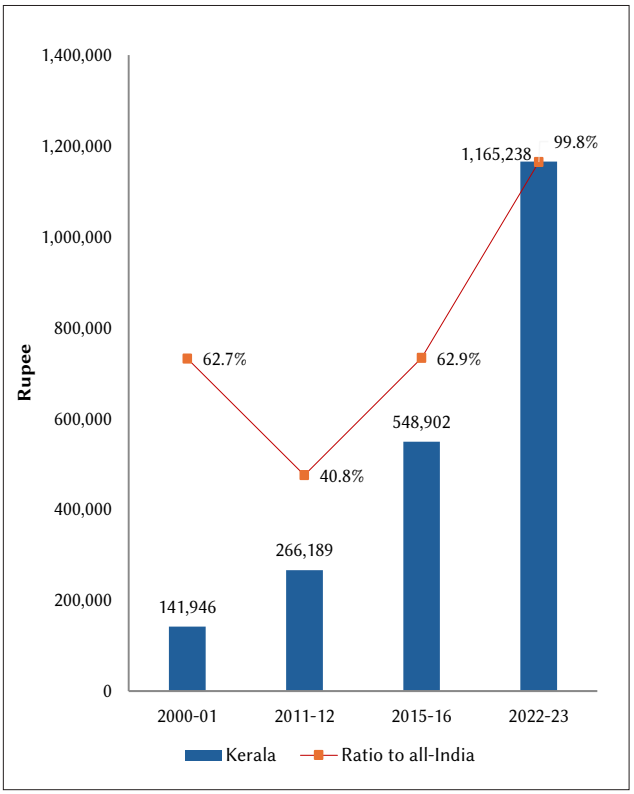


Figure 14.1 *Labour productivity in the organised manufacturing sector, Kerala, 2000-01 to 2022-23* in Rs and per cent
Source: Annual Survey of Industries

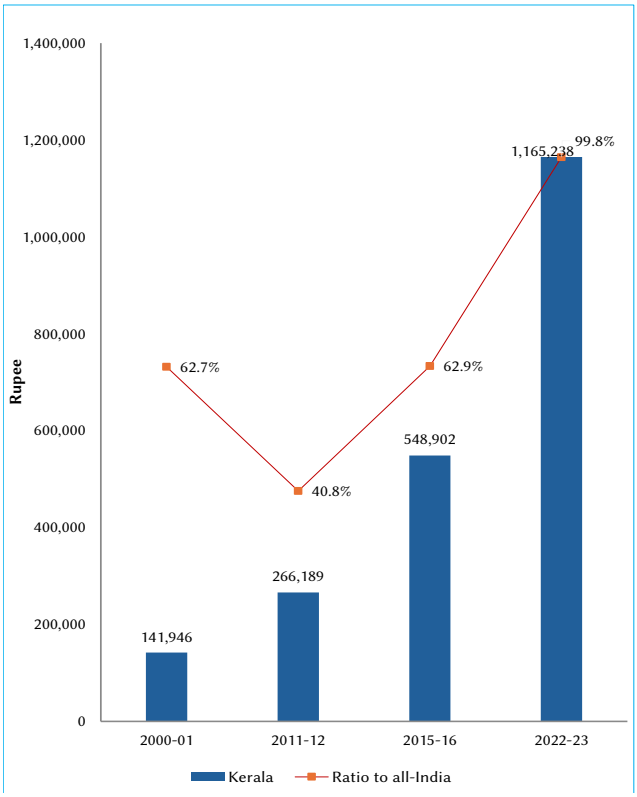


Figure 14.2 *Average earnings per employee in the organised manufacturing sector, Kerala, 2000-01 to 2022-23* in Rs and per cent
Source: Annual Survey of Industries

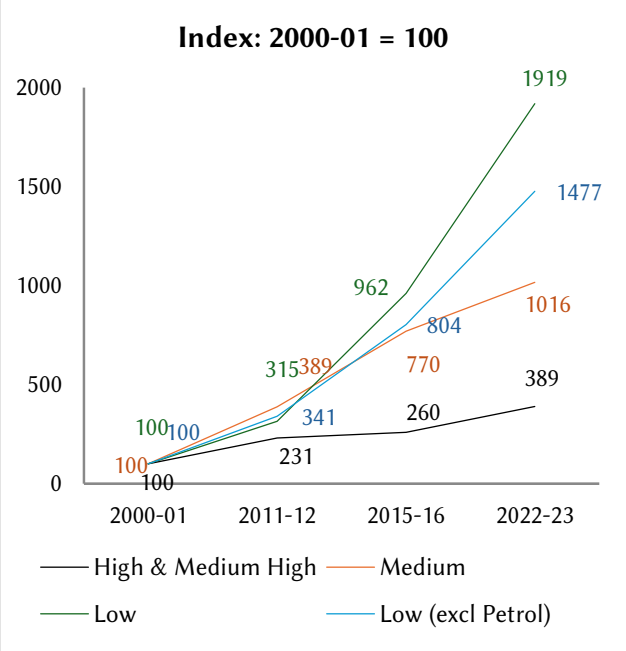


Figure 14.3 *Capital per employee in the organised manufacturing sector, Kerala, 2000-01 to 2022-23 (indexed growth)*
Source: Annual Survey of Industries

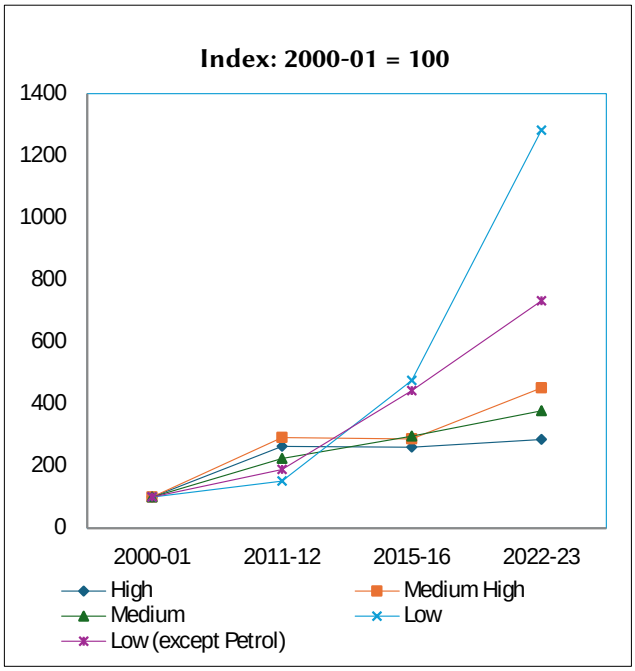


Figure 14.4 *Labour productivity in the organised manufacturing sector, Kerala, 2000-01 to 2022-23 (indexed growth)*
Source: Annual Survey of Industries

Factories in Kerala can be grouped into four technology levels: low tech (food, textile, tobacco, etc); medium tech (rubber, cement, metals, etc); medium-high tech (chemicals, machinery, vehicles, etc); and high tech (pharma and electronics). In recent years, the share of employment has increased in medium-tech, medium–high tech and high-tech factories, and declined in low-tech sectors. The increase in the share of employment is significant in the case of medium tech and high tech factories, implying higher employment opportunities in the high tech factory sector, and a change in sectoral patterns of employment in the sector. The fall in low tech employment is mainly on account of the increased capital intensity and resultant increase in productivity. These changes are consistent with the efforts of the State Government to modernise production that ensures gains for employers and the workers.

Industrial Initiatives in the 13th and 14th Five-Year Plan

The 13th Five-Year Plan focused on strengthening manufacturing in Kerala through two strategies. The first focus was on food and agro-based industries that have strong linkages with the State's agricultural, natural and marine resources. They include industries that add value to agricultural products including rice, coconut, rubber, pepper, cardamom, banana, and pineapple; forest and marine resources; and traditional industries such as coir and cashew processing. The second strategy promoted industries in specific segments such as chemical and petrochemical, electronics, port-based, and engineering sectors. It also included enterprises in computing and media technologies, biotechnology, nanotechnology and life sciences.

Traditional industries, including coir, cashew and handloom, were supported through investment in modernisation, diversification of output and measures to maintain stable wages and employment

The 14th Five-Year Plan adopted the guiding principle of responsible investment and responsible industry. The State aims to promote industries that adhere to Environmental, Social, and Governance (ESG) criteria, with a focus on ethical manufacturing that considers labour welfare, environmental sustainability, and societal requirements. The aim was to develop Kerala as a destination for industrial investment that is environmentally sustainable, productive, and employment-generating.

The 14th Plan also promoted modern Micro, Small and Medium Enterprises (MSMEs) by leveraging the specific competitive advantages of Kerala where land for industrial use is scarce. The State continues to prioritise the development of "sunrise sectors", especially technology-driven emerging sectors

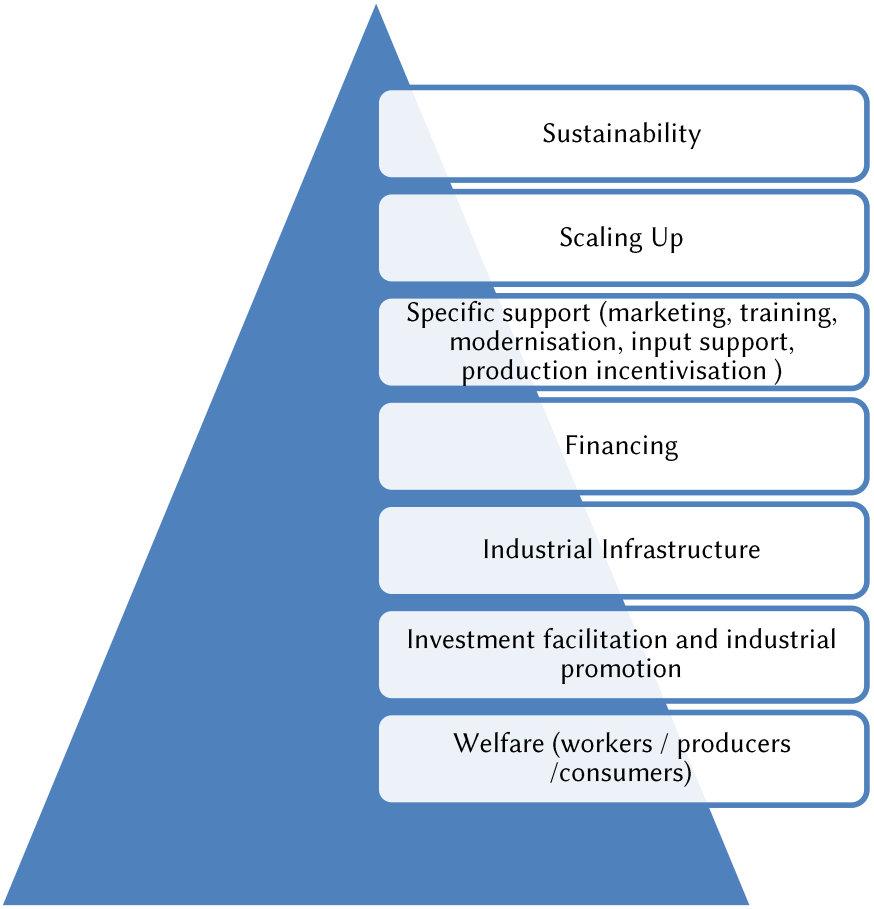


Figure 14.5 *Dimensions of Government intervention in the industries sector, Kerala*

including life sciences, biotechnology, agro and food processing, pharmaceuticals and drug manufacturing, petrochemicals and specialty chemicals. The 14th Plan also seeks to revive traditional industries by introducing modern technologies and identifying new market segments.

Kerala has translated the vision put forward by the Five-Year Plans into schemes and programmes for implementation. Figure 14.5 shows the dimensions of government intervention.

Financing Industrial Development

The main sources of funding for industrial development in Kerala are the State Government, through dedicated funding agencies under the State Government and commercial banks. Since 2016–17, the State Government has spent more than Rs 7,448 crore on industry through the Annual Plans, covering small-scale industries, commerce, traditional industries, medium and large industries, and mining and geology. State Government funding for industrial development ensures fund flow across different stages of the value chain.

Kerala State Industrial Development Corporation (KSIDC) and Kerala Finance Corporation (KFC) are the dedicated agencies under the State Government supporting industrial development in the State. They use both Government funds and their own resources to support enterprises through equity, loans and other forms of credit. Between 2016-17 and 2024-25, KSIDC's assistance has expanded. KSIDC has disbursed Rs 6,263 crore as share capital and Rs 1,779 crore as loans, of which 77 per cent has been recovered. The number of units supported has increased from 12 in 2016-17 to 133 in 2024-25. It also provides credit for women-led enterprises and early-stage ventures. The annual amount disbursed increased from Rs 64 crore in 2016 to Rs 2,166 crore in 2024.

KFC finances new and existing MSMEs in manufacturing and services. Banks have complemented these efforts, with credit to MSMEs increasing in both

share and volume, and with MSME advances more than doubling from Rs 39,463 crore in 2016 to Rs 80,210 crore in 2024. The new environment for industries in Kerala and success of entrepreneurs in Kerala has also instilled confidence in the banking sector to provide advances for such initiatives

Industrial promotion and investment facilitation

Since 2016-17, the State Government has adopted a vision to transform Kerala into an investor-friendly destination through inclusive, eco-friendly, and sustainable economic growth with a focus on the creation of employment opportunities. Industrial promotion and investment facilitation has played a key role in the new path for industrial growth in Kerala. Understanding the need for a robust industrial policy, the Government of Kerala introduced the New Industrial Policy in 2023 to accelerate its industrial growth and create more employment opportunities.

There are seven focus pillars identified in the policy. They are fostering entrepreneurship; enabling infrastructure; IR 4.0 ready with robotic manufacturing, data analytical tools; skillset upgradation for futuristic jobs; sectoral ecosystems; ESG compliance; and the "Kerala" brand. There are 22 focus sectors identified in the New Industrial Policy 2023. Incentives include low interest loans, capital subsidies, electricity duty exemption, access to finance through the IPO route, investment subsidy, State Goods and Services Tax (SGST) reimbursement, employment enhancer incentive, waiver of stamp duty and registration charges for manufacturing units, private industrial estates, incentive for participation in trade fairs, intellectual property creation, quality certification incentive, incentives for sustainability and responsible industrialisation, Industrial Revolution 4.0 initiatives in manufacturing, research and development incentive, scale up support for startups, Made in Kerala (branding and marketing), and special package to attract Production Linked Incentive (PLI) investors.

The State Government has implemented a number of reform measures to ease the process of setting up enterprises in Kerala. To promote industries and facilitate investment, the State Government has improved the ease of doing business through the implementation of various digital and legislative reforms. These reforms are part of the State Business Reforms Action Plan (SBRAP), which aims to streamline government-to-business service delivery. SBRAP has been in effect since 2016, following guidelines from the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India. The State has made significant progress in implementing business reforms, with the percentage of reforms executed increasing from 22.8 per cent in 2016 to 99.1 per cent in 2024. Kerala was recognised as the Fast mover in SBRAP 2024, earning the Top Achiever title in 4 reform areas, the highest among all States and Union Territories. This achievement reflects a significant turnaround, with Kerala improving its ranking from 28th in 2019 to top position in 2024 (Fast mover category). This progress highlights the positive impact of the State's business-friendly reforms.

The State now operates a single-window system called K-SWIFT (Kerala Single Window Interface for Fast and Transparent Clearance), through which businesses can obtain 113 State-level and national-level approvals across 22 departments. Additionally, K-SWIFT is integrated with the National Single Window System (NSWS), allowing businesses to secure necessary central approvals as well, streamlining the entire approval process. The State has also implemented the Kerala Centralised Inspection System (K-CIS), an online platform designed to schedule departmental inspections, ensuring greater transparency and objectivity in the process. K-CIS is used by departments such as Labour, Factories and Boilers, the Pollution Control Board, and Legal Metrology to manage and conduct compliance inspections. A total of 25,000 inspections have been carried out through this system.

The Kerala Investment Promotion and Facilitation Act, 2018 is a significant milestone. It mandates the approval of an eligible application within a period of 30 days. The Act seeks to avoid delays in granting various licenses, permissions, approvals and clearances required under the various enactments and improve the investment environment. The reform process continued with the enactment of the Kerala Micro Small Medium Enterprises Facilitation Act 2019, the Kerala Micro Small Medium Enterprises Facilitation (Amendment) Act 2021; and the Kerala Industrial Single Window Clearance Boards and Industrial Township Area Development (Amendment) Act 2022 (grievance redressal mechanism). These have facilitated the growth of manufacturing in Kerala.

Industrial Infrastructure and Park-led Industrial Development

Kerala is a small State, where land for industrial use is scarce. The situation is further compounded by the fact that a significant portion of the available land falls under the ecologically sensitive category, making

Box 14.1

Invest Kerala Global Summit 2025

The Invest Kerala Global Summit 2025, organised by the State Government, was the largest such event in Kerala's history. It positioned Kerala as a global investment destination. The summit received an overwhelming response with 449 Expression of Interest (EOIs), translating into a total proposed investment of approximately 1.8 lakh crore and an estimated employment generation potential of 5.8 lakh jobs.

The main highlight of the Summit was the participation of representatives from 26 countries, around 4,000 industry leaders, startups, and investors, 115 exhibitions. The summit hosted six country sessions, and multiple B2B meetings. A dedicated mobile application with summit-related information allowed individuals with industrial land to list it for potential investors, who could directly connect with them. The App also provided details on KINFRA, KSIDC, Government estates, and approved private industrial parks in the State.

The summit was a culmination of several sector-specific meetings, including maritime and logistics, waste management and recycling, ayurveda and pharmaceuticals, tourism, food processing, and retail. Road shows were organised in Dubai, Delhi, Mumbai, Bengaluru, Coimbatore, and Chennai to promote the Summit. The Summit was preceded by the Vizhinjam Conclave (to position Vizhinjam as a prominent player in global trade) and the Kerala Automotive Conclave held in Thiruvananthapuram.

This investment momentum has already translated into early project implementation, with 109 projects (24.3 per cent)as on December 31, 2025 having commenced construction representing active investments of about Rs 35,608.2 crore.

land a high-cost resource. To overcome this challenge, the Government has been developing industrial parks equipped with facilities to support MSMEs. In recent years, the State Government supported the creation of new industrial parks, the expansion of existing parks, the utilisation of unused land in existing parks, development of modern or new facilities in existing parks and increased the efficiency in allocation of land and park infrastructure.

In 2016-17, KSIDC had 6 industrial parks, with 5.7 acres of developed land allotted to 11 units, providing employment to 145 individuals. The number increased to 11 in 2025-26, with 707.3 acres of developed land allotted to 360 units, providing employment to 12,950 individuals. The KSIDC Industrial Space (Kasaragod), Business Park (Angamaly), and Coconut Industrial Park are being developed. The major achievements of Parks under KSIDC are the following:

Life Science Park. A dedicated park for the life sciences sector is being developed to address the needs of life science/biotechnology/nanotechnology sectors. Phase-I of the park has been completed, with 17 companies functional, employing 700 individuals and with investments worth Rs 650 crore as on December 2025. Around 95 per cent of Phase-II is also complete.

Medical Devices Park. A joint initiative between KSIDC and Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), this Rs 260 crore project is being developed in 9 acres within the Life Sciences Park (Phase-I). The construction works of the Prototype and Incubation Centre and Animal House are now complete.

Mega Food Park, Cherthala. A Mega Food Park is established at Pallipuram, Cherthala in 64 acres of land at a total cost of Rs 129 crore. Operations have commenced, with an expected investment of Rs 1000 crore and employment for 3,000 individuals. Currently, five units are in operational, and land has been allotted to an additional 22 units. Facilities developed at the park include a 20,000 sq ft standard design factory building, a Common Facility Centre, and a 9,000 sq ft warehouse.

Between 2016 and 2025, Kerala Industrial Infrastructure Development Corporation (KINFRA) developed and allotted 766 acres of land and 13,50,867 sq.ft of built-up space for 928 units, generating employment to 46,013 individuals and attracting investments worth Rs 4,868 crore. Leading companies functioning in this space including TCS, Tata Elxsi, V-Guard, Agappe Diagnostics, Hykon, Vinvish Technologies, Trans-Asian Shipping Co., Jolly Coats, D-Space and Genrobotics. KINFRA has effectively implemented a single window clearance system across all its parks. The list of completed park projects are in Table 14.1.

Table 14.1 *Park projects completed by KINFRA, Kerala, 2017-2025*

Sl No	Name of park	Nature of construction	Inauguration Year
1	KINFRA Small Industrial Park, Thalassery, Kannur	SDF Building	2017
2	KINFRA Small Industrial Park, Korraty, Thrissur	SDF Building	2020
3	KINFRA Mega Food Park, Palakkad	Park	
4	KINFRA Defence Park, Ottapalam, Palakkad	Park	2021
5	KINFRA Mini Industrial Park, Mundakkal, Kollam	Park	
6	KINFRA Techno Industrial Park, Kakkanchery, Malappuram	SDF Building	
7	KINFRA Techno Industrial Park, Kakkanchery, Malappuram	Standard Design Factory Building	
8	KINFRA Film and Video Park, Trivandrum	Standard Design Factory	2022
9	KINFRA Advance Technology Park, Ramanattukkara, Kozhikode	Standard Design Factory	
10	KINFRA Spices Park, Muttom, Idukki (Phase I)	Industrial park	2023
11	KINFRA International Exhibition Centre, Kakkanadu ,Kochi	Exhibition Centre	2024
12	KINFRA Industrial Park, Mattannur	Standard Design Factory	
13	KINFRA International Convention Centre, Kakkanadu, Kochi	Convention Centre	2025
14	KINFRA Mini Industrial Park, Thonnakkal, Trivandrum	Park	

Source: Kerala Industrial Infrastructure Development Corporation, Government of Kerala

The ongoing projects under KINFRA are the following:

Unity Mall at Techno Park, Thiruvananthapuram. This is a Rs 120 crore project to provide a dedicated platform to promote traditional, locally manufactured, and GI-tagged products from Kerala and other States. The five-storied commercial building includes an amphitheater, spacious retail outlets, an exhibition area, conference rooms, parking facilities, and a large auditorium. Half of the Union Government's interest free loan has been sanctioned. Construction is progressing rapidly.

Mini Industrial Park, Thonnakkal. This is a mini-industrial park for MSMEs, at over 7.5 acres in Vellore Village, Mangalapuram Panchayat. The park will provide infrastructure such as roads, water supply facility, power supply system, 24-hour security, and street lights to operate non-polluting general industries. The total project cost is Rs 9 crore. The project is expected to attract an investment of Rs 30 crore and

create 300 jobs. The allotment procedure in this park is underway, out of 6.4 acres of allottable land, 5.8 acres have already been allotted to 14 entrepreneurs.

Petrochemical Park, Kochi. Spread over 481.8 acres of land acquired from Fertilisers And Chemicals Travancore Ltd, the park will create a petrochemical cluster anchored by Bharath Petroleum Corporation Limited. At present, land has been allotted to 26 companies. Once fully operational, it is expected to attract investments of Rs 10,000 crore and create 10,000 jobs.

KINFRA Film and Video Park, Trivandrum, Phase-II, Standard Design Factory. A new seven-storey, 1.8 lakh square feet building is under construction to meet the growing IT /ITES demand. The project cost is Rs 78.5 crore. It is 30 per cent completed. A Memorandum of Understanding has been signed for full allotment of the building, and is expected to generate 2,500 directs and 1,500 indirect jobs, with an anticipated investment of Rs 600 crore.

Kochi-Bangalore Industrial Corridor Land Acquisition. This Industrial Corridor is a special project of the Government of India to accelerate industrialisation. KINFRA is authorised to implement the project in the State. Approximately 1,400 acres of land have been acquired in two nodes. The Palakkad node is expected to attract investments of Rs 10,000 crore and is expected to generate 22,000 direct and 80,000 indirect employment opportunities. On August 28, 2024, the Government of India has approved the Integrated Manufacturing Cluster at Palakkad. A revenue of around Rs 600 crore per annum is expected to be created through this project. As of December 2025, about 1,350 acres of land has been acquired in Puthussery central and Kannambra (Palakkad).

The development of Private Industrial Parks is a policy initiative, to address the scarcity of industrial land, boost industrial development, create more job opportunities for the youth of the State and attract more investment in the industrial sector. The Government has sanctioned the establishment of industrial parks by private entrepreneurs who own more than 10 acres. About 33 Private Industrial parks are approved and of them, 6 are already functional.

The Campus Industrial Park is another innovative project launched by the Government to utilise the unused land under the jurisdiction of higher educational institutions across the State for industrial purposes. The project will help to overcome the shortage of land in the State for industrial purpose, to develop industrial awareness among the student community and also improve industrial production through research in educational institutions.

The Co-operative Industrial Park Scheme is a plan to develop industrial parks on the unused land owned by the institutions working in the co-operative sector. Co-operative Societies / Institutions that own at least 7 acres of land or hold at least 7 acres of land on lease for at least 30 years can apply for Cooperative Industrial Park Developer Permit.

There are substantial differences in the policies for land allocation of the various agencies, and the cost of renting/purchasing industrial land from them. The Government has notified the Unified Industrial Land/Building (Allotment and Disposal) Regulations for KINFRA and KSIDC in 2024, enabling entities to set up industrial units in the land/building owned by the KINFRA and KSIDC in a hassle-free manner. Highlights of the policy include a focus on logistics and warehousing sector, allocation of land on annual rental basis, allotment of plots to private builders/developers, and provision for mortgage of leasehold rights to financial institutions to secure loans.

Industrial Framework in Kerala

The framework of the industrial sector in Kerala includes MSME, Medium and Large industries, and Traditional industries. Traditional industries comprise coir, cashew, handloom and textiles, handicraft, and khadi.

Micro, Small and Medium Enterprises (MSMEs)

The Micro Small and Medium Enterprises (MSMEs) sector are the second largest employment providers in the country, next to the agriculture sector. MSMEs play an important role in the social and economic progress of Kerala. The sector is emerging as a major income-generating and employment–providing sector with relatively lower investment. Kerala has a relatively high share of MSMEs, in handicrafts, handloom, khadi, food processing industries, garment-making and textile industries, and industries related to coir, wood, bamboo, plastic, rubber, leather, and clay products.

The Directorate of Industries and Commerce implements schemes that support entrepreneurship development and industrial promotion. It coordinates, finances, and advises MSMEs, and oversees 14 District Industries Centres, Common Facility Service Centres, and a Documentation Centre. The Kerala Bureau of Industrial Promotion (K-bip), an autonomous body under the Directorate, implements industrial cluster development activities. Kerala Institute for Entrepreneurship Development (KIED) functions as a nodal knowledge

centre for entrepreneurs and investors to identify suitable projects and establish industrial units.

The key initiatives during 14th Five-Year Plan include the scaling up of MSMEs and start-ups in manufacturing, facilitating market infrastructure for MSMEs, introduction of "Made in Kerala" brand products, initiating new policies and programmes targeting current issues, new areas, and emerging opportunities. Since 2016-17, the Government of Kerala has spent more than Rs 1,071 crore for the development of small scale industries, and Rs 45 crore on developing commerce.

Increase in the number of MSMEs. The registrations under the Udyog Aadhar Memorandum (UAM),

Box 14.2
Year of Enterprises

The Government of Kerala declared 2022–23 as the Year of Enterprises with the motto "My Enterprise, Nation's Pride." During 2022–23, a total of 1,39,839 enterprises were registered in the State, with an investment of Rs 8,422 crore, and generating 3,00,049 new employment opportunities. Building on this success, Year of Enterprises 2.0 was launched in 2023–24 with the objective of creating 1,00,000 MSMEs in the State, with a special focus on increasing per-unit investment and job creation, while also ensuring the sustainability of the units formed under the initiative, providing marketing and financial support, and enhancing the skills and knowledge of entrepreneurs. Leveraging the systems established during the Year of Enterprises initiative, 1,03,596 units were set up in 2023–24 with a total investment of Rs 7,048.7 crore, creating 2,18,179 jobs. The initiative was continued in 2024–25 as Year of Enterprises 3.0, under which 1,17,442 enterprises were registered with an overall investment of Rs 7,798.5 crore. These units generated 2,48,810 employment opportunities up to November 20, 2025.

In total, more than 3,60,801 MSMEs have been registered in the State as part of the Year of Enterprises initiative with an investment of Rs 23,250.7 Crores and creating more than 7,66,733 job opportunities till November 20, 2025. During the Year of Enterprises campaign, the highest number of MSME units were started at Ernakulam District (35,730 units with an investment of Rs 3,213.3 crore generating 85,980 employment opportunities) followed by Thiruvananthapuram and Thrissur Districts.

A large number of units were started in the trade sector (1,58,649), followed by service (1,51,973), and manufacturing (50,179) sectors. The Year of Enterprises initiative was able to meet the objectives to reach to all the sections of the society, including the weaker sections with 60 per cent (2,12,019) of the units being formed by entrepreneurs from Other Backward Classes, 7.4 per cent (26,033) from minority categories, 3.7 per cent (12,555) from Scheduled Caste categories, and 0.3 per cent (1,026) from Scheduled Tribe categories. Around one-third of the units (1,12,497 units) were formed by women entrepreneurs. Details are shown as below.

Table 14.2 *Sector-wise details of new MSME units started under Year of Enterprises campaign, Kerala, 2022-23 to 2025-26* in numbers

Name of Sector	2022-23	2023-24	2024-25	2025-26 (till 20 Nov)	Total
Manufacturing	21,989	14,035	13,197	958	50,179
Service	53,300	45,691	49,371	3,611	1,51,973
Trade	64,550	43,869	47,124	3,106	1,58,649
Total	1,39,839	1,03,595	1,09,692	7,675	3,60,801

Source: Directorate of Industries and Commerce

an online registration form for Indian Micro, Small, and Medium Enterprises (MSMEs) to certify their existence and access government benefits, on March 31, 2025 were 8,44,168 UAMs filed which include 2,19,818 manufacturing units, and 6,24,350 units in the service sector. The Government of Kerala introduced new initiatives including Samrambhaka Sabha, a Panchayat-level collective established through the Year of Enterprises campaign to improve market access, skill development, and assistance for entrepreneurs. A new insurance scheme introduced in 2024–25 provides compensation for losses due to unforeseen circumstances such as fire and natural calamities, and has covered 1,108 entrepreneurs with an expenditure of Rs 20.7 lakh. The Kerala Brand initiative has begun to promote State-made products, starting with coconut oil manufacturers. The Mission 1000 initiative by Government of Kerala is aimed at uplifting 1000 Micro, Small and Medium Enterprises (MSMEs) in the State into businesses with Rs 100 crore turnover within four years, and Rs 3,500 lakh has been allocated for the scheme. By March 2025, 376 enterprises have enrolled in the scheme, 105 detailed project reports are approved, and Rs 73.4 lakh have been disbursed to 58 enterprises.

Financial support. The Entrepreneurship Support Scheme is the main financial support scheme available to MSMEs. Between 2016–17 and 2024–25, Rs 471.4 crore has been disbursed to 8,091 units. The Margin Money Grant to Nano Units supports very small manufacturing, job work, and service units, with Rs 46.6 crore disbursed to 1,728 units. Covid-19 resilience measures were introduced to revive defunct and stressed MSMEs, support modernisation requirements, and provide interest subvention for term loans, working capital and nano household enterprises. Under the nano household category, 362 units received support through the margin money component and 648 units received interest subvention. Pandemic-related relief measures continued through the Vyavasaya Bhadratha Scheme, which supported 1,865 MSMEs, and the Stressed MSME Rehabilitation Scheme, which assisted 245 units. Together, these interventions broadened access to finance during the recovery period.

Infrastructure development. Schemes supporting the infrastructure development of MSMEs includes the MSME Cluster Development Programme (a Scheme with Central assistance). Of the 16 approved Common Facility Service Centres (CFSC), 12 have been completed at a cost of Rs 7,522.4 lakh. Another four are being developed, at an approved outlay of Rs

Table 14.3 *Details of MSME units started, Kerala, 2016-17 to 2025-26* in numbers and in Rs crore

Year	No. of MSME units	Investment (in Rs crore)	Employment (in number)
2016-17	15,535	1,387.1	57,445
2017-18	15,468	1,249.6	51,244
2018-19	13,826	1,321.9	49,068
2019-20	13,695	1,338.6	46,081
2020-21	11,540	1,221.9	44,975
2021-22	15,285	1,535.1	56,233
2022-23	1,39,839	8,421.6	3,00,051
2023-24	1,03,595	7,048.6	2,18,179
2024-25	1,09,692	7,217.8	2,31,468
2025-26 (till Nov 20, 2025)	7,675	562.5	17,075
Total	4,46,150	31,304.9	10,71,819

Source: Directorate of Industries and Commerce

4,997.3 lakh. Other infrastructure schemes include improving infrastructure in existing development areas and development plots, construction of multi-storied industrial estates, modernisation of existing Common Facility Service Centres, and the development of industrial parks and estates on PPP mode.

Union Government Support. Centrally Sponsored Schemes provide additional support. Under the Prime Minister Formalisation of Micro Food Processing Enterprises (PM-FME) scheme, designed to upgrade and formalise micro food-processing enterprises, Rs 87.1 crore was disbursed to 3,507 beneficiaries between July 2022 and March 2025. The Government of India provides 60 per cent of the funds for the scheme. Under Prime Minister's Employment Generation Programme (PMEGP), which supports new micro enterprises and the expansion and modernisation of existing PMEGP and MUDRA units, 695 projects were validated with margin money assistance of Rs 19.9 crore for loans amounting to Rs 59.1 crore. Of these, 662 projects were approved, with sanctioned loans of Rs 55.5 crore and margin money of Rs 18.7 crore. Raising and Accelerating MSME Performance (RAMP) programme was introduced in 2024-25, with Rs 107.7 crore approved for strategic investment in the sector.

Other interventions. The Government of Kerala implemented several programmes to strengthen the MSME ecosystem, improve access to finance, and promote entrepreneurship across sectors. The One Local Body One Product initiative moved into active implementation, with 456 Local Self-Governments (LSGs) identifying local products to promote value-added enterprises at the grassroots level. The Kerala Bureau of Industrial Promotion supported infrastructure-linked cluster development, coordinated activities under the Micro and Small Enterprises Cluster Development Programme, and organised exhibitions, business meetings and technical workshops that reinforce the industrial ecosystem. The Kerala Institute for Entrepreneurship Development strengthened its outreach through training programmes and the establishment of 305 Entrepreneurship Development Clubs in educational institutions, engaging nearly 25,000 participants since 2018-19. The Kerala Bureau of Industrial Promotion organised the Machinery Expo 2024 where 161 stalls displayed machinery from within and outside the State. It also undertook a wide range of activities from implementing cluster development and food processing schemes to facilitating MSME participation in major expos, conducting regional exhibitions and B2B meetings, supporting bamboo sector development, and organising prominent events such as the Kerala Bamboo Fest, World Coffee Conference Expo 2023, Vyapar 2022, and the Malabar Crafts Fair.

Medium and Large Industries

Major agencies involved in the development of Medium and Large Industries are Kerala State Industrial Development Corporation (KSIDC), Kerala Industrial Infrastructure Development Corporation (KINFRA), Bureau of Public Transformation (BPT), Bureau of Public Enterprises (BPE), Kerala Rubber Limited (KRL,) and Centre for Management Development (CMD). Since 2016-17 to 2025-26, the State Government has spent more than Rs 3,845 crore for the development of the Medium and large industries in Kerala through these agencies.

Kerala's industrial structure is distinct because of the large number of State and Central PSUs operating in the State, in manufacturing, chemicals, engineering, electronics and related areas. The Government of Kerala supports public sector transformation, with the 13th Five-Year Plan supporting long-term revival and the 14th Plan focusing on the application of biotechnology, nanotechnology, biomedical sciences, and biochemical engineering to create value-added products. The revival of loss-making PSUs through modernisation, diversification, and better management practices continues to guide interventions.

The Government of Kerala has implemented a set of institutional governance reforms to revive and make PSUs more competitive. A new institutional arrangement called Public Sector Transformation (BPT) was created in 2023 by reconstituting the earlier Public Sector Restructuring and Internal Audit Board (RIAB) These efforts are focussed on ensuring their professional management and autonomy at the Board level, induction of independent technical experts in the Board and enhanced performance monitoring. BPT has introduced mechanisms for executing MoUs, business plans and to set performance targets for PSUs. The State also established the Kerala Public Enterprises Selection and Recruitment Board in 2022 to ensure transparent recruitment to senior positions.

These interventions have strengthened the performance of State PSUs. The number of profit-making units has increased to 14 in 2024-25. Between 2016-17 and 2024-25, the turnovers of State PSUs under the Industries Department has increased nearly 89 per cent, to Rs 5,135.9 crore. The turnovers of

Table 14.4 *Performance of State Public Sector Undertakings under Industries Department, Kerala, 2016-17 to 2024-25* in Rs crore

Profit-making units				
Particulars	2016-17	2021-22	2023-24	2024-25
Number of units	12	15	12	14
Turnover	1,727.5	3,073.2	2,455.6	3,358.4
Profit made by profit making units	91.8	405	123.3	167.5
Loss-making units				
Number of units	28	34	37	35
Turnover	993.8	1,442.4	2,005	1,778
Loss made by loss making units	225.3	461.8	634.1	473.8
Total units				
Total number of units*	40	49	49	49
Total turnover	2,721.3	4,515.6	4,460.4	5,135.9
Total employment	15,785	27,954	28,437	28,860
Net profit/loss (-)	-133.5	-56.8	-510.8	-306.2

Source: Bureau of Public Sector Transformation
Note: *The number of units whose accounts were tabulated. The actual number of units is higher.

profit-making units have almost doubled, while profits have increased over 80 per cent. The turnovers of loss-making units have increased almost 80 per cent. Government support for PSUs has led to 83 per cent increase in employment in the sector. (Table 14.4)

Kerala remains a notable stronghold of State-run factories while the national policy encourages privatisation, under investments and closure. Kerala has the largest number of Government-owned factories in India (163 units), the same as its neighbour Tamil Nadu, as per Annual Survey of Industries, 2023-24. Kerala's 33,781 employees in this sector constitute 8.8 per cent of total Government factory employment nationwide.

In terms of Gross Value Added, Kerala contributes 11.3 per cent of the national total, just behind Maharashtra. Over the last nine years, Kerala has achieved a cumulative nominal GVA growth rate of 15.6 per cent.

Traditional industries

Traditional industries including coir, handloom, cashew, khadi and village industries and handicrafts employ a significant number of individuals, including a large number of women. The Government supports measures to reinvigorate these industries and ensure their sustainability.

Coir. The coir industry remains one of the largest traditional industries in the State. An estimated one lakh workers depend on coir, the majority of whom are women. Between 2016-17 and 2024-25, the Government of Kerala spent Rs 1,027.5 crore for the development of the sector through Annual Plans. The Government supported programmes for price stabilisation that ensured employment and income for the workers, and programmes on modernisation (including regulated mechanisation), product diversification, and effective marketing and distribution strategy. A significant proportion of the sector comprises of cooperatives.

In 2024-25, Kerala had 1,055 coir co-operative societies, of which 492 were working societies employing 20,277 workers. Between 2016–17 and 2024-25, the Government of Kerala has spent Rs 446.8 crore on price stabilisation, and between 2016-17 and 2024-25, Rs 227.1 crore was disbursed to 20,000 coir workers. The modernisation programme introduced during the second reorganisation of the coir industry in

Table 14.5 *State-wise GVA growth of Government-owned factories, 2016-2024*

State	2016			2024			Growth CAGR %
	Public Sector Enterprises	Employees	Gross Value Added (In Rs crore)	Public Sector Enterprises	Employees	Gross Value Added (In Rs crore)	
Kerala	170	42,786	5,756	163	33,781	17,801	15.2
Tamil Nadu	268	57,523	5,597	163	38,876	9,236	6.5
Gujarat	406	63,667	8,354	139	20,321	3,189	-11.3
Maharashtra	343	57,292	58,237	98	26,224	18,863	-13.1
Chhattisgarh	90	31,880	5,173	86	36,216	5,203	0.1
Karnataka	151	23,447	4,610	74	18,705	10,148	10.4
West Bengal	152	48,369	5,061	63	37,320	12,437	11.9
Odisha	51	57,072	7,834	60	42,955	17,009	10.2
Madhya Pradesh	31	20,723	5,380	46	16,842	15,104	13.8
Uttar Pradesh	117	27,734	4,525	46	21,260	9,675	10.0

Source: Annual Survey of Industries 2016 and 2024

2018-19 has been central to productivity improvement, guaranteeing social protection to the workers. From 2019-20 to 2024-25, Rs 216.7 crore was spent under this initiative. The thrust areas included technology-enabled procurement and decentralised fibre extraction, distinct strategy for the traditional spinning and weaving sector, modernisation of industrial spinning and weaving sector, product diversification of industrial coir with focus on non-woven sector, institutional support for the coir sector (product development/research and development), and marketing of public and private enterprises. From 2016-17 to 2024-25 more than 26,000 electronic ratts and around 1,500 automated spinning mills were deployed across more than 500 societies. As a result, yarn production increased from 7,880 tonne in 2016 to 26,976.3 tonne in 2025.

Handloom and Textiles. The handloom and textiles industry comprises public, co-operative, and private units engaged in spinning, weaving and garment production. The State Government's interventions in the handloom and textiles sector have focused on modernisation, value addition, improved raw-material access and worker welfare. More than Rs 602 crore has been spent in the sector through Annual Plans since 2016–2017, up to January 2026. Handloom production recorded double the productivity in 2023-24 compared to 2016-17, with the number of looms declining but cloth production increasing by 60 per cent. Co-operative units accounted for most of the looms and reported increased productivity, while private units contributed to higher value-added output. In the powerloom sector, the number of powerlooms nearly tripled, with production increasing by 5 times and turnover by 10 times. The shift in the composition of the powerloom sector is quite evident with the increasing prominence of the corporate/unorganised / private sector. While productivity increased in private and unorganised units, there has been a decline in co-operative powerloom units.

The State Government has established an integrated support framework for the handloom sector, structured around four key areas: pre-production, production, post-production, and welfare and management. During the pre-production stage, support is provided through modernisation and upgradation initiatives, revitalisation schemes, and capital support schemes. Production support is through subsidies for quality raw materials, margin money loans for procuring quality raw materials, training and skill development programmes, assistance for the bulk purchase of cotton yarn, and the establishment of textile processing centres. Post-production interventions aim to enhance livelihoods and market access by promoting the establishment of handloom villages, supporting self-employment

and business incubation, group insurance schemes, marketing and export promotion, and propagating the Handloom Mark. Welfare and management measures include infrastructure development, training for upgradation of facilities, health and welfare programmes, product development assistance, and production incentives, ensuring comprehensive support to weavers and the overall sustainability of the handloom ecosystem.

Cashew. The cashew sector consists of Government-owned and private processing units contributing to production and export. There are 100 units in the State, of which 40 are Government-run, employing an estimated one lakh workers, a majority of whom are women. The number of operating units and the people they employ remain central to the sector's economic relevance, especially in Districts where cashew processing has historically provided large-scale female employment. Government-owned units form a distinct segment within the sector, supporting wage security and livelihood continuity for workers during periods of volatility in raw nut availability.

In the 13th Five-Year Plan, the Government of Kerala focused on stabilising the sector through targeted financial support, revival of defunct units, increasing domestic raw nut production, introducing modernisation and partial mechanisation, promoting value addition, product diversification, ensuring cost effectiveness, marketing and exports. These interventions were aimed at protecting employment, improving the operational viability of units and addressing the persistent scarcity of raw cashew nuts. The Kerala Cashew Development Corporation provides more than 120 days of work annually to more than 10,600 workers, and Kerala State Cashew Workers Apex Cooperative Society provides around 150 days of work to about 3,700 workers. CAPEX has additionally absorbed 1,759 workers who lost jobs due to closure of private factories.

Cultivation of cashew within the State has remained limited, and domestic production falls significantly short of the requirements of processing units. Although cashew cultivation expanded from 90.9 ha in 2016-17 to 110.5 ha in 2024-25, production declined from 83,980 tonnes to 64,920 tonnes due to climate and disease-related factors. The sector therefore continues to depend heavily on imported raw nuts to maintain capacity utilisation. This structural dependence, along with international price fluctuations, remains a key challenge. The Kerala Cashew Board was established in 2017 to overcome the shortage of raw nuts and ensure the availability of raw cashew nuts to processing units. Since 2017-18, the Kerala Cashew Board imported 78,006 tonnes of raw nuts, supported by Rs 293.3 crore in State assistance.

Handicrafts. Kerala supports 32 recognised craft forms in which around 1.7 lakh artisans are engaged. The sector includes ivory, wood, horn, bell-metal and coconut shell craft. Since 2016-17, around Rs 36 crore has been spent on Annual Plan schemes in this sector.

Table 14.6 *Production and import of raw cashew in Kerala, 2016-17 to 2024-25* in ha, MT, and Rs lakh

Year	Production area (ha)	Production quantity (MT)	Raw cashew imported by Cashew Board (MT)	State assistance to Cashew Board (Rs lakh)
2016-17	90.9	83,980	-	-
2017-18	92.8	88,180	Nil	1,500
2018-19	96.6	82,889	6,668	950
2019-20	98.8	69,624	13,634.7	Nil
2020-21	103.2	73,105	10,836.1	5,330
2021-22	106.5	71,760	9,956.4	3,730
2022-23	108.6	74,630	9,880.5	6,085
2023-24	110.3	76,380	14,000	7,655
2024-25	110.5	64,920	13,030.1	4,081

Source: Directorate of Cashew and Cocoa Development (DCCD), Government of India; Kerala Cashew Board Ltd

Khadi and Village Industries. There are 29 khadi institutions that operate in the State under organisations aided by the Khadi and Village Industries Board (KKVIB) and Khadi and Village Industries Corporation (KVIC). The floods of 2018 and 2019, the Covid-19 pandemic, and broader economic conditions have affected the industry considerably. State support has ensured that the industry remained functional despite these adversities. The 14th Five-Year Plan aimed to increase production by 25 per cent annually, create 10,000 new jobs, and establish 1,500 new units and 75 new sales outlets. The Plan also aimed to achieve self-sufficiency in khadi production, revitalise khadi cooperatives and village industries, improve conditions of workers, and promote exports through the modernisation of production centres and offices, marketing, and the revival of defunct units. Since 2016-17, more than Rs 62.3 crore has been spent on development programmes covering infrastructure, training, marketing, and the revival of defunct units.

Achievements

MSMEs. The MSME sector recorded several notable achievements in the last ten years. All thirteen services provided by the Directorate of Industries and Commerce were fully digitised, significantly improving accessibility and efficiency for entrepreneurs. Kerala also became the first State in India to adopt the Responsible Investment, Responsible Industry approach as part of its industrial growth strategy, strengthening the commitment to sustainable development. To strengthen market access for local enterprises, the Commerce Mission — formed in December 2018 — continues to play an important role in promoting indigenous products in both domestic and international markets. Dedicated online platforms, including two new MSME websites and an e-market portal, were launched during the period to expand visibility and improve marketing opportunities for MSMEs and PSUs. The Kerala Institute for Entrepreneurship Development (KIED) extended their activities for entrepreneurship development including training programmes and the formation of entrepreneurship development clubs in schools and colleges. A major regulatory step forward was the enactment of the Kerala Government Land Allotment and Assignment for Industrial Purposes Rules, 2023, which aims to create a more entrepreneurship-friendly environment through clearer and more supportive land policies.

Medium and Large Industries. Between 2016 and 2025, public sector undertakings in Kerala have registered significant progress. The number of profit-making PSUs increased to 14 in 2024-25.

Two central PSUs, Hindustan Newsprint Limited and the Bharat Heavy Electricals – Electrical Machines Limited joint venture, were revived under the State's Alternative Development Policy and resumed operations as Kerala Paper Products Limited and KEL-Electrical Machines Limited. Kerala Paper Products Limited supplies newsprint to several major newspapers today.

The Government of Kerala introduced efforts to revive PSUs into agents of technological transformation. In the electronics sector, Keltron expanded its presence in defence, aerospace, intelligent traffic systems and underwater electronics, securing orders worth over Rs 1,000 crore in 2023–24 and signing an MoU with Eltorque of Italy for advanced actuator manufacturing. Its subsidiaries strengthened their capabilities, including commissioning India's first supercapacitor manufacturing facility and developing underwater testing facilities. The electronics sector registered a net profit of Rs 34.5 crore.

In the electrical sector, companies have begun to reduce their dependence on KSEB. Transformers and Electricals Kerala Limited (TELK) executed over Rs 200 crore worth of orders for national agencies and recorded an operating profit exceeding Rs 6 crore in 2024–25. Kerala Electrical and Allied Engineering Co. Limited restored profitability and expanded their production of traction alternator and EV motors, while United Electrical Industries Limited implemented new units for LED street lights, smart meters, polymer insulators and modern starter equipment.

In the chemicals sector, Kerala Minerals and Metals Limited (KMML), and Travancore Cochin Chemicals and Kerala Ceramics Limited improved output and profitability. KMML has planned major upgrades, including revamping the acid recovery plant and modernising the titanium sponge and mineral separation units.

Travancore Titanium Products Limited completed major waste management projects and is modernising core production systems. Kerala State Drugs and Pharmaceuticals Limited strengthened its manufacturing capacities with World Health Organisation's Good Manufacturing Practice certifications and new facilities for injections, ophthalmics, and other formulations.

The Cotton Board was established in 2022 to support spinning mills in the public and co-operative sectors. Foam Mattings India Limited returned to profit after 18 years. The State also implemented business plans

and performance agreements in PSUs and launched an e-commerce platform, K-shopee, to support the wider marketing of PSU products.

Coir. Kerala has strengthened the coir value chain through price stabilisation measures, sustained support to co-operative societies, and extensive welfare support for traditional workers. A major component of this support is the Income Support Scheme, under which Rs 163.1 crore has been distributed since 2016-17 to around 20,000 traditional coir workers to ensure minimum wages. The State also promoted the use of coir geo-textiles through a large-scale partnership with local governments, significantly expanding domestic demand. The National Coir Research and Management Institute (NCRMI) has enhanced the sector's innovation capacity by developing new value-added products and undertaking training programmes to upgrade worker skills and encourage quality production. The Kerala State Coir Corporation (KSCC), which supports small manufacturers by procuring their products and ensuring stable market access, has remained consistently profitable. KSCC has expanded into major e-commerce platforms (Amazon, Pepperfry, IndiaMart), and secured a collaboration with Walmart. It has received multiple recognitions, including the Best Quality Excellence Award (2023) and top exhibitor awards at the India International Trade Fair 2023 and 2024. KSCC has also established a new product research and design centre in collaboration with NID Bhopal, with the first batch of 100 workers trained.

Cashew. The cashew sector in Kerala has witnessed significant strengthening through Government-led interventions across cultivation, processing, and worker welfare. A major achievement has been the modernisation of processing facilities, including the installation of new cutting machines, which increased productivity in Kerala State Cashew Development Corporation Ltd (KSCDC) units from 85 MT/day to 115 MT/day, without any reduction in labour. This marks a rare instance of productivity gains achieved alongside employment protection. The Government has ensured continuous employment and income stability for workers during periods of raw nut scarcity. KSCDC has provided over 120 days of work annually to more than 10,600 workers, while CAPEX has provided around 150 days of work to 3,700 workers. Government support for modernisation and partial mechanisation, amounting to Rs 229 crore since 2017-18, has improved workplace conditions through upgraded infrastructure and hygienic, women-friendly factory environments. KSCDC increased its turnover from value-added products from Rs 1.8 crore in 2016-17 to Rs 17.4 crore in 2024-25, while CAPEX expanded its value-added product sales and diversified into retail channels including ONDC, government platforms, and its own online sales. The Kerala Cashew Board's bulk import mechanism has enabled uninterrupted operation of public-sector processing units. Since 2017-18, the Board has imported 78,006 MT of raw nuts. KSACC has expanded cultivation by distributing over 36 lakh grafts, covering 15,696 hectares, and promoting high-density and ultra-high-density farming. Kerala is a major exporter of Cashew in the country, mainly to Middle East countries. In 2023-24, 48 per cent of India's total cashew export value was from Kerala, according to the Directorate General of Commercial Intelligence and Statistics, Government of India.

Handloom and Textiles. The Government of Kerala has implemented schemes and programmes in the sector on modernisation, raw material support, skilling, production incentives, market development and institutional strengthening. In ten years around Rs 27 crore has been invested in modernisation alone, including the installation of over 2,250 new looms, renovation of more than 1,000 worksheds, support for dye houses, loom accessories and pre-loom facilities, as well as the revival of key textile mills. To ensure affordable raw material for weavers, the Government established the Cotton Board, supported by a Rs 70 crore revolving fund through a National Co-operative Development Corporation (NCDC) loan, along with additional subsidies for yarn banks, Kerala State Handloom Weavers Co-operative Society Ltd (Hantex), Kerala State Handloom Development Corporation Ltd. (Hanveev).

In order to ensure the sale of handloom products and ensure value realisation, the Government of Kerala has supported the Handloom rebate scheme. Goods are sold by the Primary Handloom Societies, Hantex, and Hanveev at a discounted price, and the discount value is reimbursed by the Government. The Government has spent nearly Rs 94 crore on the scheme since 2016-17, and introduced a revival package for Hantex worth Rs 20 crore in 2025-26. Skilling initiatives such as Yuva Weave and training programmes at Indian Institute of Handloom Technology (IIHT) Kannur have helped equip young and untrained individuals. Production and income support measures have strengthened livelihoods across the sector. Over Rs 41 crore has been provided as production incentives since

2016–17, supporting around 3,300 weavers annually. The Income Support Scheme has been implemented in collaboration with the Labour Department to ensure a minimum wage of Rs 150 per day for weavers. This benefit is available to workers who complete 100 days in a year. Under the Contributory Thrift Scheme scheme, a minimum of 8 per cent of the wages of the weaver worker is collected and an equal amount is made available from the Government. The Income Support Scheme and the Contributory Thrift Scheme together have delivered more than Rs 20 crore to workers, benefiting over 30,000 individuals, and a new health programme was introduced in 2024–25.

Market development has been significantly strengthened through the introduction of the Handloom Mark and K-Brand certifications, geo-tagging of thousands of units and workers, and the establishment of design studios. The flagship Free Handloom School Uniform Scheme introduced in 2017 has been successful in increasing employment, wages, and person days of work to the handloom workers. About 9 lakh students receive the benefit annually, and around 6,200 weavers are involved each year in production. From 2016-17 to 2024-25, the Government has spent more than Rs 620 crore for the scheme. Together, these interventions strengthen every stage of the value chain- raw material procurement, production, design, skilling, marketing, and institutional strengthening.

Challenges

Kerala's industrial ecosystem faces several persistent and sector-specific constraints. Across the MSME sector, key challenges include inadequate support infrastructure, limited ability of enterprises to scale up from micro to small and medium categories, insufficient access to affordable credit, weak industry–academia linkages, and a shortage of innovative, market-driven entrepreneurial ideas. Medium and Large Industries face gaps in modernisation, particularly in older units and PSUs.

Traditional industries continue to encounter structural constraints. The coir sector struggles with a shortage of coconut husk due to small landholdings and weak aggregation systems, along with high production costs, low productivity, shortage of working capital, limited product diversification, and strong competition from other regions. Handloom and powerloom sectors face competition from cheaper and faster substitutes, changing consumer preferences, scarcity and rising cost of raw materials, slow pace of technological adoption, low productivity, and growing administrative and production costs. Cashew cultivation faces climate-related risks, disease incidence, competing land uses, slow spread of high-yielding varieties, and challenges in modernising processing units. The cashew industry also suffers from high processing costs, limited raw nut availability at competitive prices, and competition from global players.

Handicrafts face raw material scarcity, rising costs, stiff competition, shrinking export markets, shortage of skilled artisans, and limited working capital. Khadi and village industries remain heavily dependent on Government support and struggle with weak marketing systems, limited product diversification, and inability to adapt to evolving market demands.

Across all sectors, the need for improved modernisation, better access to finance, enhanced design and technology adoption, greater productivity, stronger market presence, and sustainable institutional capacity remain central to future growth.

Way Forward

Kerala's overall industrial strategy continues to emphasise sustainability, modernisation, innovation and stronger institutional systems across sectors. For MSMEs, the path ahead involves scaling enterprises effectively, improving infrastructure, expanding access to credit, fostering entrepreneurship, and leveraging the State's new industrial policy and initiatives such as Mission 1000. Strengthening industry–academia linkages, deepening technology adoption through technology access funds and clinics, and diversifying the startup ecosystem beyond IT remain essential. The Government's reforms and interventions to revive PSUs have been successful, and will be continued. The Government looks forward to the creation of manufacturing enterprises in the cooperative sector as well.

Traditional industries are being repositioned for revival with a clearer long-term strategy. In coir, the expert committee constituted in 2022 recommended measures such as improving raw-material availability, enhancing the roles of KSCMMC and NCRMI in modernising and improving utilisation of machinery, strengthening research and development, creating a design wing within NCRMI to drive innovation and diversification, and exploring PPP models for dormant society infrastructure. These recommendations now shape the State's approach, which prioritises modernisation, mechanisation, improved product quality, and access to new markets.

In handloom and powerloom, the expert committee recommended a shift towards self-sustaining societies, a

Kerala Handloom Mission/Task Force for managerial and technical support, creation of a handloom incubator for innovation and premium product development, brand activation through a certification authority with a digital authentication system, a revival plan for Hantex and Hanveev, adoption of high-value fibres and modern implements (such as electronic jacquards), and a Handloom Promotion Project to expand demand and marketing. These recommendations form the basis for a forward strategy centred on modernisation, design development, premium product diversification, and stronger branding and traceability.

For cashew, two expert committees — one on private processing units and another on overall industry revitalisation — recommended reducing overheads, phased mechanisation, improved procurement mechanisms, product diversification, focused marketing, positioning "Kerala Cashew" as a premium brand, introducing value-added products, enhancing women-friendly work environments, and promoting cashew cultivation in underutilised land parcels. Short-term programmes such as continued-operation incentives for processing units have been introduced based on these recommendations. The future direction will focus on modern technology, improved productivity, sustainable processing, and targeted global marketing.

In handicrafts, the way forward involves expanding common facility centres, improving microfinance access, strengthening artisan clusters, establishing tourism-linked craft villages, and further expanding bamboo cultivation to support raw-material availability, replicating the recommendations emerging from State reviews of the sector.

For Khadi and village industries, greater self-sufficiency, improved marketing systems, new product development, and institutional strengthening remain central to future strategy, aligning with recommendations emphasising reduced dependence on State assistance.

Across the ecosystem, Kerala's long-term industrial vision is anchored in its skilled workforce, strong education system, high participation of women, and global exposure through its diaspora. Strengthening industry–academia partnerships, accelerating technology adoption, supporting research-driven production, and enabling innovation will be crucial for competitiveness. The State aims for an industrial transformation that is socially and environmentally responsible, supported by private investment and productivity enhancement. The momentum generated by initiatives such as the Year of Enterprises must be consolidated through deeper facilitation, efficient regulatory processes, and alignment with national and global trends.

Kerala's ability to combine its sectoral strengths with emerging opportunities positions the State for sustained, modern, innovation-led industrial growth in the coming years.

Chapter 15
Leveraging Science and Technology for Development

The Goverment of Kerala accorded priority to the development and advancement of science and technology in the 13th and 14th Five-Year Plans. The policy of the Government from 2016 to the present has been to build a robust science, technology, and innovation ecosystem in the State by harnessing its transformative potential, while also promoting a scientific temper in society, particularly among youth. Over this period, the State has made significant progress in science and technology through an emphasis on innovation, digital transformation, and inclusive development. This progress has been supported by a comprehensive and universal school education system, as well as social organisations committed to the popularisation of science and the promotion of a scientific temper. Together, these social strengths provide a unique and strong foundation for Kerala's science, technology, and innovation ecosystem.

The State has expanded its network of science parks, incubators, and research institutions, to encourage startups and foster a vibrant innovation ecosystem. The strategy of innovation-driven development is reflected in the establishment of Kerala Space Park, Science Park, Innovation Centre for Graphene, Kerala University of Digital Sciences, Innovation and Technology, Kerala Genome Data Centre, Kerala Medical Technology Consortium, Institute of Advanced Crop Breeding, among others. Additionally, the Kerala Fibre Optic Network (KFON), a large-scale digital infrastructure project has strengthened Kerala's position as a growing hub for science and technology in India.

The science and technology ecosystem in Kerala promotes scientific research, innovation, and technological development through active collaboration between Government departments, educational and research institutions, and the industry. It is driven by the Department of Science, Technology, and Environment (DSTE) and the Kerala State Council for Science, Technology, and Environment (KSCSTE), which support policy-making, research funding, and knowledge dissemination. Kerala's strong network of universities, research centres, and technical institutes form the educational backbone, producing skilled professionals in Science, Technology, Engineering, and Mathematics (STEM). The industry, particularly in areas such as biotechnology, information technology, space technology, and green energy, translates this knowledge into practical solutions, products, and services. Initiatives like the Kerala Startup Mission (KSUM), the three Science Parks (Thiruvananthapuram, Ernakulam and Kannur), and Technopark further support this innovation ecosystem. This synergy between the Government, academia, and industry continues to drive the State's progress in science and technology.

Science and Technology in 13th and 14th Five-Year Plans

The 13th Plan emphasised science, technology, and innovation for sustainable development and inclusive growth of the State. Key areas included high quality research, new schemes in nanotechnology and biotechnology, and better coordination and collaboration between research institutions and higher education. It also aimed to increase the participation of women and people belonging to Schedule Castes and Schedule Tribes in science and technology to build a diverse and inclusive human resource base. Green Technology Initiatives and programmes to support the research and development on assistive technology were introduced in 13th Plan period.

The 14th Five-Year Plan placed strong emphasis on building a robust Sceince Technology and Innovation ecosystem, in line with the challenges identified in the Kerala Development Report 2021, such as the weak connections between technology research and its application in production, quality gaps across different levels of science and technology education and research, and insufficient collaboration between Kerala's science and technology institutions and those in the rest of India and abroad. To address these concerns, the Plan focused on science popularisation and promotion, development of human resources, strengthening the collaboration of industry, academia, and research and development, expanding international scientific collaborations and funding opportunities, fostering innovation and entrepreneurship, advancing science and technology education, promoting technology development and indigenisation, and establishing a strong science and technology infrastructure, all with a monitoring, evaluation, and feedback framework.

From 2016-17 to 2024-25, Plan expenditure in the sector was Rs 1,003 crore. In addition to Plan support, KSCSTE and its research and development centres have successfully mobilised significant external funding from national and international agencies, with support peaking in 2021.

Science and Technology Institutions

The major institutions under the Department of Science, Technology, and Environment in Kerala are the Kerala State Council for Science, Technology and Environment (KSCSTE), Institute of Advanced Virology (IAV), and the Regional Cancer Centre (RCC)[1]. Research and development centres under KSCSTE include the Kerala Forest Research Institute (KFRI), National Transportation Planning and Research Centre (NATPAC), Centre for Water Resources Development and Management (CWRDM), Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), Kerala School of Mathematics (KSoM), Srinivasa Ramanujan Institute for Basic Sciences (SRIBS), Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS), and Institute of Climate Change Studies (ICCS). KSCSTE also plans to establish two new centres- Institute of Diabetic Research and Institute of Advanced Crop Breeding.

The Integrated Rural Technology Centre (IRTC), Sophisticated Testing and Instrumentation Centre (STIC), and M S Swaminathan Research Foundation (MSSRF) Regional Station, Wayanad are the grant-in-aid institutions under KSCSTE.

Kerala State Council for Science, Technology and Environment (KSCSTE)

KSCSTE's mission is to connect basic research with societal impact, fostering innovation, entrepreneurship, and economic growth through infrastructure and cross-sector collaboration. Some initiatives of KSCSTE and the Centres under it, and achievements across sub-sectors are as follows.

Fundamental research. In line with its vision and mission, the Kerala State Council for Science, Technology and Environment (KSCSTE) has focused on maintaining a balance between fundamental and applied research during the 13th and 14th Plan periods, supported by successful institutional models such as the Srinivasa Ramanujan Institute for Basic Sciences (SRIBS) and the Kerala School of Mathematics (KSoM). Together with its research and development institutions, KSCSTE has secured the 27th position among Indian Government institutions and ranked 1,161 globally in the Nature Index 2025.

Translational research and innovation ecosystem in Kerala. KSCSTE has made remarkable progress in promoting translational research, with a focus on research that is aligned with industry demand and societal needs. Important achievements in the last 10 years include the antifungal gel patented by JNTBGRI, self-composters developed by CWRDM, and sustainable agro-tech developed by KFRI. Till 2023–24, more than 80 patents have been filed, and more than 15 technologies have been made ready for commercialisation.

Specialised centres addressed regional challenges. The State Higher Research Centres of Excellence in Science and Technology Applications (SHRESTA) programme addressed regional challenges like floods and climate change, and the use of nanotechnology. The Centre of Excellence in Phytochemical Nanotechnology at JNTBGRI developed a plant-based nano-fibre wound healing solution, and has been commercialised through international collaborations. An AI-driven hydrological model using India Meteorological Department (IMD) forecasts to predict floods has been developed by CWRDM.

KSCSTE established Science Parks in Ernakulam, Thiruvananthapuram, and Kannur, focusing on material science, sustainable technology, and bioprocessing. Parks provide advanced laboratories, startup incubation facilities, and promote industry-academia collaboration. A Centre of Excellence in Nutraceuticals (CoEN) is established at the Institute of Advanced Virology in the Bio360 Life Science Park, Thonnakkal. It focuses on non-communicable diseases, and validating and commercialising health products. A Centre of Excellence in Microbiome (CoEM) has been established at the KINFRA Film and Video Park in Thiruvananthapuram, which focuses on the use of multi-omics, AI, and big data to develop microbiome-based health and environmental solutions.

Human capital development. Between 2016 and 2024, KSCSTE and its research and development centres expanded their workforce across scientific, technical, and administrative roles. This was achieved through structured fellowships, student programmes, and research grants. Between 2016–17 and 2023–24, 400 PhDs were awarded. The Research Fellowship Scheme was central to this progress, supporting 250–500 scholars annually, with a stipend of Rs 35,000 per

[1] For information on the Regional Cancer Centre, see Chapter 5

student per month in 2023–24. There were 16 fellows under Post-Doctoral Fellowship Scheme in 2016-17 which increased to 24 in 2023-24. The discipline-wise number of research fellowships is shown in Figure 15.1.

Student participation was encouraged through the Student Project Scheme, which supported 200 to 500 projects annually, and the Crafting Young Scientists of Tomorrow (CRYSTAL), programme, which mentored about 30 students per year. By 2023–24, more than 1,000 students and researchers had received technical training in laboratory methods and fieldwork.

Infrastructural support. From 2016 to 2024, KSCSTE and its research and development centres invested in upgrading science and technology infrastructure across Kerala, from school laboratories to advanced research facilities. The Information and Communication Technology (ICT) systems at the KSCSTE Headquarters were strengthened through campus-wide Wi-Fi, e-Office, online project submission, Prathibha scholarship portal, e-tendering, and a digital library with access to national and international journals.

Under the Sastraposhini scheme, modern physics, chemistry, and biology labs were established in Government high schools. Under the scheme, five Government high schools were supported in 2016-17, four Model Residential Schools (with funding from the Scheduled Tribes Development Department) in 2017-18, and eight high schools were supported by MLA funds. Research and development support was extended to colleges and universities under the Selective Augmentation of Research & Development (SARD) scheme.

Under the Karamana River Scientific Management Project (2016-17 and 2019-20), pump houses, riverbank protections, bathing ghats, weirs, bridges, surveillance systems, bio-parks, and sewage management systems were created. Other programmes such as the Science Research Scheme, Ecology and Environment Programme, Engineering and Technology Programme, Technology Development and Adaptation Programme (TDAP), and Rural Technology Programme) have developed specialised facilities in medical imaging, green energy labs, improved vehicular ventilation systems, and rural technology units.

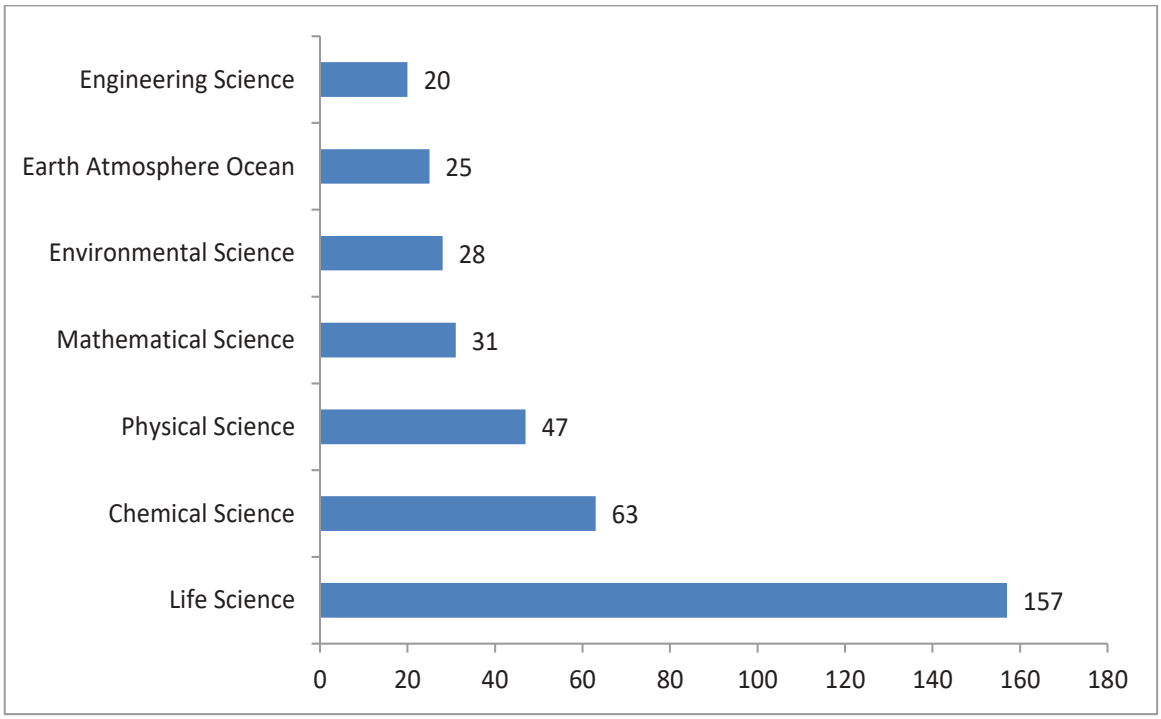


Figure 15.1 *Discipline-wise distribution of research fellowships under KSCSTE, 2016 to 2024*
Source: KSCSTE, Thiruvananthapuram

Infrastructure at KSCSTE's research and development centres was strengthened in parallel. A supercomputing facility is being established at the Srinivasa Ramanujan Institute for Basic Sciences (SRIBS). An Orchidarium and a Cacti House is being established at the Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS). The Institute for Climate Change Studies (ICCS) upgraded its computational facilities between 2022 and 2024, and developed experimental setups for climate research. The Integrated Rural Technology Centre (IRTC) created a laboratory for waste and water quality analysis and installed an automatic weather station in 2018-19. Sophisticated Test and Instrumentation Centre (STIC) installed a 25 KW solar panel in 2018-19 and is setting up a Solar PV system Test facility. KSCSTE has also initiated the establishment of the Institute of Advanced Crop Breeding (IACB) to address issues related to climate change and crop productivity, emphasising technology integration, holistic genomic approaches, and molecular mapping for precise crop identification.

Science popularisation. KSCSTE has promoted science literacy through awards, science outreach, and science popularisation programmes. The Kerala Sasthrapuraskaram recognises scientists of Kerala origin for their contributions to science and technology. Previous laureates include Prof. MS Swaminathan (2021) and Prof. PK Ramachandran Nair (2022). Over 25 researchers have received the Kerala State Young Scientist Award (KSYSA), with a total grant of Rs 4.5 crore. More than 45 science communicators have been honoured for contributions in writing, translation, and journalism. More than 100 institutions participate annually in public engagement programmes such as the National Science Day and Technology Day, which include the events Science-on-Wheels (2022–23) and Designathon (2023). The National Mathematics Day 2023 hosted special camps for 25 visually impaired students.

The Kerala Science Congress, a forum for promoting science and knowledge, hosted over 4,000 papers across eight editions, along with initiatives like SciSol and Walk with Scientists to foster local innovation and policy dialogue. The National Children's Science Congress engaged 500 to 2,000 students annually. Events to promote innovation such as Tech Fest and Rural Innovators' Meet showcased over 150 student innovations and over 300 rural technologies.

KSCSTE supports over 50 science publications, including Sasthra magazine, and provides journalism fellowships. The Action for Science to Society through the Education and Training (ASSET) programme provided hands-on training in science and sustainability to thousands of rural students and teachers.

Support for research and development. KSCSTE's research and development centres play a key role in research and training activities, and support scientific research in the form of PhDs, post-doctoral fellowships, internships, and undergraduate and postgraduate dissertations. The centres also train Government officials, NGOs, and students. Between 2016 and 2024, these institutions awarded 179 PhDs, mentored 32 post-docs, supported over 3,000 internships and dissertations (both under-graduate and post-graduate), and conducted nearly 1,500 workshops, seminars, and trainings.

Ensuring inclusive development. KSCSTE is committed to inclusive and equitable science education in Kerala. The Back-to-Lab Programme enables women to resume scientific careers. Between 2016 and 2025, it supported 44 women scholars across 39 institutions, who contributed to 18 publications and two patents in fields which include cancer vaccines, marine microplastics, and 5G components. The Women in Science Conclave mentors women researchers, and the Prathibha Scholarship Scheme awards scholarships to women students pursuing basic/natural science degrees

KSCSTE also has programmes for students with disabilities, including through providing assistive devices and technologies.

The Scheduled Caste and Scheduled Tribe Cell at KSCSTE was established in 2021 to promote science and technology education. The Cell also documents and integrates indigenous knowledge with modern science for culturally relevant solutions.

Policy development. KSCSTE has a central role in shaping Kerala's science and technology policy. It promotes research with polemic relevance. The Council led the formulation the Science, Technology and Innovation (STI) Policy 2022, and prepared draft policies on Intellectual Property Rights (IPR) (revising the 2008 policy of the State), Biotechnology, and Traditional Knowledge. The Council will also draft ethical guidelines for research and development in the State. The Council has assisted in the preparation of the Kerala State Innovation Policy, the State of Environment Report 2021 and the revision of the Technology Start-Up Policy of 2014. The Council also assisted the Directorate of Environment and Climate Change, Government of Kerala, in revising the State Climate

Change Policy, the State Action Plan on Climate Change (SAPCC 2.0), and the State Biodiversity Strategy and Action Plan (SBSAP).

Integrated approaches to water security in Kerala. Water security is a major concern as a result of climate change, water scarcity, and ecological stress. Key response measures facilitated by KSCSTE include water security plans, hydrological modeling, and climate-resilient tools. Crop-specific irrigation schedules were implemented using hydrological systems. Kerala is the first Indian State to integrate water budgeting in local planning. The State-level Water Budget is part of the Navakeralam Mission (2023–24), and covers more than 250 Panchayat in the State.

Scientific tools like HYDRAH (Hydrological Rainfall Analysis for Humid Tropics) and a drought monitoring Decision Support System were developed. This is complemented by the WATER-CAT app, which ensures public participation. Wick irrigation has improved the efficiency of water management in irrigation systems. Institutional capacity was strengthened with NABL accreditation of the CWRDM Water Quality Lab and a new water quality laboratory has been established at Neyyattinkara, Thiruvananthapuram.

A Centre of Excellence for Water-related Disaster Management has been established at CWRDM. A Food and Water Testing Facility is proposed to be established at STIC–CUSAT, where hands-on training in water quality analysis is also provided. A SWAT model was used for climate research in the Chaliyar river basin, and a satellite-based drought prediction model was introduced in 2023–24. A European Union-funded Climate Change Learning Lab is established at CWRDM to promote research-policy integration. The Lab publishes Annual Climate Summaries since 2021. A high-resolution rainfall dataset is under development.

Other important projects under the Council include the desilting of Aruvikkara reservoir, the treatment of perchlorate-contaminated water, and the study of soil water flux in high-altitude areas. CWRDM received the AMRUTAM Sustainable Technology Award (2022), showcasing Kerala's innovative, science-driven, and community-based model for water security.

Transportation and climate-resilient infrastructure in Kerala. NATPAC developed a GIS-based road and traffic database, used modelling tools, and real-time data systems to improve planning, road safety, and mobility management. NATPAC prepared a mobility plan for Thrissur, a growth model for National Highways in the State, assessed urban mobility needs including multi-storey parking and junction upgrades. NATPAC has conducted various studies related to the transport sector. Detailed project reports (DPRs) were prepared for a coastal highway with cycle tracks in Thiruvananthapuram, Kollam, and Alappuzha, and feasibility of inland waterways between Kovalam and Kollam was studied. Road safety was enhanced with crash prediction models, audits of 123 Pradhan Mantri Gram Sadak Yojana (PMGSY) projects, and short-term measures at 75 accident black spots. An Intelligent Transport System and the GetMap mobile app were launched to provide real-time road data. NATPAC identified 323 vulnerable road corridors that require intervention. It also studied the impact of flood on pavement durability in flood-prone areas.

Waste management and health. KSCSTE and its research and development centres promote eco-friendly, technology-driven, and community-based waste management aligned with Sustainable Development Goals. KFRI introduced biological pest control in plantations and developed biodegradable planters to reduce plastic use. It also used bamboo nurseries for riverbank stabilisation and ecosystem restoration, distributing over one lakh seedlings. CWRDM supported waste management with digital tools like WATER-CAT and HYDRAH (Hydrological Rainfall Analysis for Humid Tropics), enabling citizens and Local Self-Governments (LSGs) to monitor water quality and manage wastewater effectively.

IRTC led research and development in solid and liquid waste management, focusing on the biodegradation of municipal waste and faecal sludge, and developing microbial consortia for odour-free composting. The Ecology and Environment Programme of the Council funded projects on waste treatment, recycling, pollution control, and biodegradable solutions. Under the 14th Five-Year Plan, the Council launched the Climate-Resilient and Ecologically Adapted Model (CREAM) Villages initiative, integrating waste management with climate adaptation.

Infrastructure projects included the Karamana River Pilot Project and installation of a biogas plant and incinerator at Thiruvallom Parasurama Temple for *pooja* waste. The National Green Corps (NGC) conducted environmental awareness activities in schools, promoting sustainable lifestyles, waste management,

and elimination of single-use plastics. Technology Development and Adaptation Programme (TDAP) and the Rural Technology Programme supported the development and demonstration of innovative, need-based technologies, including rural and waste management solutions.

KSCSTE has supported innovative research in renewable energy, including titania photoanode-based solar cells and improved heterojunction silicon solar cells for cost-effective, high-performance solutions. These efforts form part of Kerala's broader strategy to enhance energy security by addressing past challenges like energy auditing, rural energy access, and affordable renewables. Though some barriers remain, ongoing research and pilot projects show strong progress toward a sustainable, decentralised energy future.

Natural disaster risk reduction and climate change research. Between 2016 and 2025, Kerala strengthened climate modelling, hydrological studies, and disaster risk reduction through the use of science and technology. The MoU signed between IIT Madras and ICCS in 2016-17 was an important milestone, enabling joint climate research. The Climate Change Knowledge Cell at ICCS, established under the National Mission on Climate Change now serves as a hub for data integration, research, and policy support. In this period, institutional collaboration and innovation has strengthened climate research and disaster risk reduction. Since 2021, ICCS publishes Kerala's Annual Climate Summary the first State-level climate report in the country.

CUSAT improved monsoon prediction with regional climate models. ICCS implemented the Soil and Water Assessment Tool (SWAT) model to assess climate impacts on the Chaliyar Basin. ICCS installed an Automatic Weather System network (2021–23) for real-time data. CWRDM studied groundwater vulnerability. KSCSTE expanded coastal weather stations and strengthened early warning systems for cyclones and floods.

KSCSTE also established a Centre of Excellence for Water-Related Disaster Management and supported projects on river basin modelling and lightning prediction. Universities including CUSAT, Kerala University, and Rajiv Gandhi Institute of Technology contributed to research on sea-level rise, coastal erosion, and flood-resilient infrastructure. Community-based adaptation projects empowered local stakeholders in vulnerable areas.

Comprehensive initiatives in ecosystem management and conservation. Over the past decade, KSCSTE and its research and development centres have led the efforts in ecosystem management and conservation. Through its Environment Division, KSCSTE promoted research, education, and awareness through programmes such as Ecology and Environment Programme, ENVIS Centre activities, National Green Corps, and Environmental Education Programme. A dedicated Wetland Technical Unit supports conservation through action plans and outreach, while Green Technology Initiatives were part of the 13th Five-Year Plan.

KFRI conducted long-term forest monitoring, riverbank stabilisation, and tree conservation using genomic tools and DNA barcoding. It raised over two lakh bamboo seedlings for restoration and established a timber forensics barcoding centre in 2023–24. JNTBGRI developed a botanic garden, reported new plant species, and created a plant-based therapeutics database. It also launched a Bamboo Museum and Craft Centre. MBGIPS, recognised as a Regional Centre of Experts (RCE), conserved rare species, developed plant conservatories, and maintains India's largest ginger garden.

Environmental education was promoted through Eco Clubs in 2,288 schools and a Carbon Neutral School project. In 2023-24, MSSRF led millet farming initiatives in Nenmeni and Pulpally Grama Panchayats in Wayanad. KSCSTE, through its Ecology and Environment Programme (EEP), also funded research on ecologically sensitive areas, home gardens, and biodiversity using remote sensing. Other studies focused on mangrove microbiomes, bryophyte diversity, aquatic ecosystems, and otter conservation.

Sustainable practices research supported eco-friendly pesticide formulations, carbon dioxide reduction using nanomaterials, wild mushroom antimicrobial potential, and sandalwood disease management in Marayoor forests. Overall, Kerala's initiatives reflect a strong, science-based approach to conservation and sustainable ecosystem management.

The Kerala Biotechnology Commission (KBC). The Kerala Biotechnology Commission (KBC) has implemented comprehensive capacity-building programmes to strengthen the State's biotechnology ecosystem and nurtures emerging talent via the Young Investigator's Programme and enhances job-oriented skills. The Biotechnology Innovations for Rural Development (BIRD) scheme promoted grassroots innovation, while the DBT Skill Vigyan Programme

trained 464 individuals — 288 students (of which, 76 per cent were women) and 176 faculty (of which, 58 per cent were women) — in life sciences and agriculture. These targeted initiatives collectively build a skilled workforce, advance research, and ensuring a robust human resource pipeline for Kerala's biotechnology sector.

Institute of Advanced Virology (IAV)

The Institute of Advanced Virology was established in the Bio 360 Life Sciences Park, Thonnakkal, Thiruvananthapuram, in 2019. It is envisioned as an institute of global standards, with modern laboratories, focusing on research, diagnosis and management of emerging and re-emerging infectious viral diseases. IAV is affiliated with the Global Virus Network, a consortium of 45 centres of excellence in over 29 countries.

The objectives of IAV in the 14th Five-Year Plan was to implement flagship programmes, commencement of academic programmes, establish facilities that include a BSI-III facility, an experimental and transgenic animal facility, a vector research and arthropod biology facility, a tumour virus diagnostics facility, and functionalise the phase IB building.

Infrastructure. IAV has completed Phase I of its campus, covering 1,10,000 sq.ft on five acres. This includes 14 BSL-2 laboratories and an Advanced Molecular Diagnostic Facility capable of detecting more than 80 viruses and other infectious agents. These include a synthetic chemistry laboratory, a phage display facility, a metagenomics facility, a virus bioassay facility, a core instrumentation facility, a small-animal experimental unit, and the innovation and translation facilitation centre (ITFC-IAV). A bio-safety level 3 laboratory is being established. IAV has also established an Outbreak Investigation Unit to conduct field studies and sero-surveillance in epidemic-affected areas. The institute functions as a referral diagnostic facility for Kerala and neighbouring States.

IAV also provides incubation facilities for startups and firms focusing on product development in diagnostic/therapeutic/preventive measures against virus infections and other infectious diseases. IAV has also initiated a project for the development of oral rabies vaccine for stray dog, aiming to control the spread of rabies in the State. IAV has standardised Real-Time Polymerase Chain Reaction (PCR) systems to detect 22 viruses using in-house primers, reducing the dependence on commercial PCR kits. The Institute of Advanced Virology (IAV) currently possesses the full range of infrastructure and human resources required to conduct high-end research on viruses and viral infections using a multimodal approach.

Academic activities. IAV offers a Doctoral Programme in Virology in affiliation with CUSAT and the Regional Centre for Biotechnology *(*RCB), Faridabad. The programme started in 2023-24. IAV also offers a certificate course and hands-on training in virology and allied subjects in collaboration with ASAP Kerala. It also provides dissertation and internship opportunities for undergraduates and post-graduates in life sciences.

A few research success stories of the Institute of Advanced Virology (IAV) include the development of Nipah virus-like particles (VLPs) that mimic the wild-type virus, enabling Nipah-related research for the development of antibodies, diagnostic kits, and therapeutic measures in BSL-2 level laboratories; the

Box 15.1
Popularising Science and Scientific Temper: Science and Technology Museums

Popularising science and inculcating a scientific temper among young minds has been an important agenda of the Government. Under the aegis of the Higher Education Department, sub-centres of the Kerala State Science and Technology Museum (KSSTM) — including the Kerala Science City in Kottayam, the Regional Science Centre in Chalakudy, and the Regional Science Centre in Parapanangadi — were made operational during the 13th and 14th Plan periods. These centres attract numerous visitors and students from across the State. Initiatives for their expansion and further development have also been undertaken. In 2019, KSSTM enhanced scientific visualisation by installing the advanced Science on a Sphere system. New galleries on Electronics Engineering, Computer Science, and Automobile Engineering were developed and opened to the public, offering interactive educational experiences. In 2023, a Virtual Reality Studio was established to promote immersive learning and the exploration of modern technologies.

development of a pseudovirus-based assay for cost-effective and rapid testing of vaccine efficacy against rabies; the establishment of diagnostic capabilities for the detection of all known types of viruses; and the preparation and in-vitro evaluation of a monovalent DNA vaccine candidate against the Zika virus, as well as bivalent DNA vaccine candidates targeting both Zika and Chikungunya viruses.

Major Challenges Faced by the Science and Technology Sector

Kerala has a history of building excellent institutions in the field of science and technology, many of which were handed over to the Central Government for further development. Kerala can benefit if more scientific institutions are based in the State. It is also essential to attract talent and retain them. Significant investment is required to continue the efforts of the State Government to expand the infrastructure of science and technology institutions in the State. It is also important to foster industry-academia collaboration. Other areas of improvement are the need for greater autonomy for research and development institutions, improving governance, improving quality and availability of data, enhancing inter-departmental co-ordination, avoiding duplication of activities, and improving access to facilities in various institutions/ universities.

Way Forward

Since 2016, Kerala has made remarkable strides in the science and technology sector, driven by a strong policy framework, strategic investments, and institutional strengthening. The State has expanded its research infrastructure, fostered innovation, and created new avenues for collaboration. Ongoing efforts to promote scientific temper, skill development, and digital literacy are benefiting the State and will be continued. Programmes aimed at strengthening academia–research–industry linkages and cultivating scientific talent are expected to make the sector more vibrant and attractive. Building an important part of science policy, particularly of the development of sciences and scientific research in universities, has been to reach out to scholars, and teaching and research departments internationally to help build capacity in higher education and research institutions in Kerala. With a sustained focus on emerging technologies, talent development, and grassroots innovation, Kerala is well positioned to harness science and technology for socio-economic transformation in the years ahead.

Chapter 16

Leveraging the Digital Revolution: Information Technology in Kerala

Kerala's achievements in the Information Technology (IT) sector reflect a strategic public policy commitment to technology-led development, inclusive growth, and innovation. The Government of Kerala has invested in world-class digital and physical infrastructure in the field of IT. It has strengthened the human capital base of the industry and provided consistent policy and institutional support. These measures have enabled Kerala to attract investment, generate employment, and formulate and implement large-scale IT, e-governance, and e-literacy programmes.

Building on its strong foundations in education, engineering, and governance, Kerala has emerged as a major IT hub. The State is capable of supporting both software-driven innovation and hardware-based product development. This capability is underpinned by an internationally recognised startup ecosystem. Its distinctive hub-and-spoke model has promoted the regional decentralisation of IT growth.

The Global Startup Ecosystem Report 2025 reported a 147 per cent increase in ecosystem value in Kerala in 2025, indicating a rise in startup formation. The report highlighted Kerala's presence among the top 10 global ecosystems for affordable talent. It also placed the State among the top 15 Asian ecosystems for value for investment and the top 35 Asian ecosystems in performance. In addition, the report identified Kerala's strengths in advanced manufacturing and robotics, artificial intelligence, big data and analytics, and life sciences. Strong Government support, skilled technical talent, and high digital adoption were identified as key strengths of the ecosystem.

A high quality of life, cost-effective operations, and robust connectivity have further strengthened Kerala's position. Pioneering initiatives, such as recognising internet access as a basic right and establishing a State-owned fibre network, have played a significant role. These efforts reflect a clear commitment to bridging the digital divide and ensuring equitable access to technology for all sections of society.

IT Sector in the 13th and 14th Five-Year Plans

In the 13th and 14th Five-Year Plans, the State focused on two main objectives for Information Technology. The first was to ensure that the benefits of IT were accessible to both the Government and society as a whole. The second focused on developing IT as an industry that would generate employment opportunities and contribute to human resource development, meeting the needs of both local and global markets.

To achieve the first objective, the State implemented measures to promote digital literacy across all segments of the population. These efforts made Kerala the first State in the country to achieve 100 per cent digital literacy. To meet the second objective of developing IT as a key industry, the Government created new employment opportunities and expanded skill training for the workforce. Kerala also established the Digital University, the first of its kind in the country, to equip young professionals with skills aligned to industry demands.

The 13th Five-Year Plan focused on creating one lakh employment opportunities, developing an ecosystem for startups, promoting innovation through new startups, facilitating the development of new products and services, enabling IT for the management and monitoring of the four flagship missions of the Government of Kerala, and expanding public access to high-speed digital services by providing Wi-Fi hotspots. The Plan also provided for integrating data from various Government departments, agencies, and institutions on a unified digital platform.

The 14th Five-Year Plan continued and expanded the missions of the 13th Plan. It included projects on digital infrastructure such as KFON, PPP models to develop plug and play infrastructure facilities, and support for hardware production. From 2016 to 2025, Plan expenditure in the IT sector has been Rs 2,929.7 crore.

Policy Support to the IT Sector

The IT Policy 2017 aims to transform Kerala into a knowledge-based society. Its objectives include establishing Kerala as a leading IT destination, generating direct and indirect employment opportunities, building world-class digital infrastructure, and strengthening human capital through education and skill development. The policy envisioned active participation from the cooperative sector and Non-Resident Indian (NRI) communities in developing IT parks to attract investment and position Kerala as a preferred IT industry destination. It also outlined measures to boost exports, create a science- and technology-driven ecosystem for research, development, and innovation, digitise

Box 16.1

Digi Keralam: A Remarkable Success Story of Vision and Commitment

Thirty years ago, Kerala made history by becoming India's first fully literate State. Today, the State has achieved another significant milestone by becoming the first in the country to attain complete digital literacy. Digi Keralam is a State-level initiative launched in 2023 by the Local Self-Government Department, inspired by the Total Literacy Campaign of 1991 and the Akshaya project. The initiative aimed to achieve universal digital literacy across the State and was implemented in three phases: data collection, training, and evaluation.

The Digi Keralam training programme covered essential digital skills, including basic smartphone usage, social media engagement, internet browsing, online payments (including the Unified Payments Interface—UPI), and access to e-governance services. The programme emphasised hands-on training, assessments, and certification aligned with UNESCO standards. Through this initiative, more than 21 lakh citizens received training.

A comprehensive door-to-door survey was conducted by over 2.5 lakh volunteers, including members of Kudumbashree, students, the National Service Scheme, the National Cadet Corps, and other community members. The survey covered 1.5 crore individuals and identified 21,88,398 people lacking digital literacy. It assessed not only access to digital devices but also familiarity with social media platforms, e-governance services, and online banking.

Pullampara Grama Panchayat served as a model for initiating these efforts at the State level. The Panchayat's initiatives to reach every resident led to Pullampara Grama Panchayat becoming India's first fully digitally literate panchayat in 2022.

The Digi Keralam project has also recorded notable success in remote and tribal areas such as Edamalakkudy, Attappadi, and Parambikulam.

Kerala is now moving into the next phase, Digi Keralam 2.0, which will focus on deepening digital literacy and further empowering citizens to participate fully in an increasingly connected and digitally enabled future.

public services, ensure universal access to data, expand digital literacy, promote the use of Information and Communication Technology in daily life, and support the use of the Malayalam language in computing.

Performance of the IT Sector

The Information and Technology sector has shown clear progress, both quantitative and qualitative, since 2016-17. Kerala has adopted a development model focused on IT parks. The number of IT companies in the State has almost doubled, from 640 in 2016 to 1,200 in 2025. Estimates show that the number of IT professionals in Kerala has more than tripled, from about 70,000 in 2016 to about 2,60,000 in 2025. IT export earnings increased from approximately Rs 9,000 crore in 2016 to Rs 26,770 crore in 2025, reflecting a 280 per cent growth over nine years.

The IT sector has undergone significant structural and compositional changes in recent years. At the turn of the century, the sector was made up of small firms working with lower-end technologies and providing support services. Today, the IT sector in Kerala includes some of the largest Indian-born multinational companies, such as Tata Consultancy Services, Infosys, and Cognizant. These companies have set up international business and delivery operations in the State and employ around 20 to 25 per cent of IT professionals in Kerala.

Several Kerala-based firms that started in the State have expanded to a global scale. UST Global, IBS LLP, SunTec Business Solutions, and NEST are examples of such companies. Some of them have moved beyond traditional services to focus on product development. Many IT firms operating in the State have the potential for further growth. These include Kerala-based firms such as QBurst, Quantiphi, InAPP, Speridian, Experion, ThinkPalm, Travancore Analytics, and Uralungal Labour Contract Co-operative Society (ULCCS); Indian MNCs like QuEST Global and Tata Elxsi; and international MNCs such as Nissan Digital and Oracle.

The State's IT ecosystem has also developed domain-specific strengths, especially in embedded systems, healthcare, and Non-Banking Financial Services (NBFCs). Some of these firms and their areas of production are listed below.

- Tata Elxsi, QUEST Global, and NEST and new age startups such as GenRobotics have positioned Kerala as growing hub for embedded systems and robotics.
- QUEST and NEST operate in multiple domains, but primarily in healthcare and medical devices. Cabot Technologies and Experion Technologies focus on developing applications for healthcare.
- TCS is planning to establish an aerospace design and development facility in the State. IBS LLP caters to all global airlines service providers. Air India has established its Centre of Digital Innovation (CODi).
- Kerala has a unique strength in the NBFC domain, with many Kerala-based firms including Muthoot, Manappuram, Geojit, and other major providers such as Shriram, Bajaj Finance, and IIFL that utilise advanced digital technology as a backbone for their operations.
- Kerala also provides knowledge-based domain services and process excellence to multinational enterprises world-wide. These domain services are classified as Knowledge Process Outsourcing (KPO) or Process-based Global Capability Centres (GCCs). Companies such as Fragomon, H&R block, EY, RMESI fall under the domain-specific GCCs, and offer services such as taxation, visa processing, and educational services to international markets.
- Kerala has a vibrant startup ecosystem. Kerala Startup Mission, Digital University's Maker Village, and Kerala State Industrial Development Corporation (KSIDC) are considered amongst the best Government enablers for startup growth. The startup ecosystem has firms engaging in diverse domains and technology. Companies such as Flytxt, Jiffy AI, are focussed on high end AI /analytics capabilities, while companies such as Care stack provide advanced technological solutions to healthcare domains. Startups such as Genrobotics, Sastra Robotics, Netraemi, NAVALT offer examples of Kerala producing promising products and solutions in the electronics, embedded systems and robotics areas.

Kerala is quickly becoming a strategic hub for international IT firms, with over 30 global companies planning to set up their GCCs in the State. This growing interest is driven by the presence of thriving IT parks in Thiruvananthapuram, Kochi, and Kozhikode, a deep and diverse talent pool, and a dynamic startup ecosystem supported by proactive Government initiatives.

The rise of companies with dedicated Centres of Excellence focused on producing innovative products and services which drive business growth through differentiation, is also notable. Kerala is home to several such innovation centres within large corporations like IBM, EY, TCS, UST, NISSAN, and Allianz, all offering high-end innovations to the world.

IT Parks

IT parks provide physical space for companies and offer a range of support services, including incubation centers for startups, mentorship programmes, and networking opportunities. The three IT hubs in Kerala are:

Technopark. Technopark in Thiruvananthapuram was established as an autonomous organisation fully owned by the Government of Kerala. It aims to create world class infrastructure and provide the technical support required for the development of industries. Technopark has grown consistently in both size and employee strength since its inception. The total number of operating companies increased from 370 in 2016-17 to 500 in 2024-25 (35.1 per cent growth), with investments increasing from Rs 4,970 crore to Rs 5,825 crore, respectively. Built-up space increased from 93 lakh sq.ft to 127 lakh sq ft (36 per cent increase). In the same period, export revenue grew from Rs 8,255 crore to Rs 14,575 crore (76.6 per cent growth), and direct employment increased from 52,746 to 80,000 (51.7 per cent growth).

The commissioning of Phase III of Technopark will make it one of the largest IT parks in India. Technopark has earned industry certifications such as Capability Maturity Model Integration (CMMI) Level 4 and ISO 9001, which show its commitment to high standards. Techno Park is also active in nurturing local talent. Technology Business Incubation, which later developed into Kerala Startup Mission (KSUM) is one example.

The park is committed to environmental responsibility and is recognised as India's most prominent green technology park. Multiple MoUs have been signed for collaborative development. These include the MoU for the World Trade Centre (WTC) with Brigade Enterprises Limited, the MoU for the Kerala Defence Innovation Zone (K-DIZ) with KSUM, and the MoU for the MSME Technology Centre with the Government of India. Technopark has maintained a CRISIL rating of A+ Stable for the last four consecutive years, confirming its sustained performance and financial stability.

Infopark. Infopark in Kochi supports innovation, collaboration, and growth across industries by offering world-class infrastructure, tailored workspaces, and a supportive business environment. The park operates under a hub-and-spoke model, with additional spokes

in Thrissur and Cherthala. Infopark has five campuses spread over 323 acres in various phases of development.

Between 2016-17 and 2024-25, a total of 39,884 new jobs were created at Infopark, the number of companies nearly doubled- from 298 to 582, and investments increased from Rs 3,000 crore to Rs 5,557.2 crore, respectively. The built-up space increased from 66 lakh sq ft to 100 lakh sq ft (51.5 per cent growth). Revenue from exports increased from Rs 3,200 crore to Rs 12,065 crore (277 per cent growth). Infopark has allotted 1.6 acres of land to the co-developer M/s Brigade for new developments. The city centre at Infopark is planned in a 36,000 sq.ft building of M/s KMRL. Indeevaram has the capacity to accommodate 17 companies that can work with 560 work stations.

Cyberpark. Cyberpark in Kozhikode became operational in 2014 and focuses on providing infrastructure for IT and ITES companies. At Cyberpark, between 2016-17 and 2024-25, the total number of companies increased from 8 to 80, revenue from exports grew from Rs 6.7 crore to Rs 130 crore, and direct employment rose from 112 to 2,300.

The existing building with 3 lakh sq ft of built-up space is fully occupied. At present, 83 IT companies operate in the SEZ facility Sahya. Cyberpark has commissioned a 25 kWp solar power plant above the park office as part of its effort to make the campus environmentally friendly. A smart business centre with an approximate area of 12,391 sq ft in the non-SEZ area has been assigned to Kerala Startup Mission to support startup companies in the Malabar region. There are 22 companies operating from this facility, employing approximately 130 IT employees. Efforts have been made to provide industrial training for recent graduates in Kerala's IT and ITES companies through the IGNITE Internship Program.

Startup Ecosystem and the Kerala Start Up Mission

The Kerala Startup Mission (KSUM) serves as the nodal agency of the Government of Kerala to promote and support startups, thereby creating a technology-driven entrepreneurial culture in the State. It has played a key role in building a vibrant environment for startups, fostering innovation, and supporting the growth of entrepreneurial ventures. KSUM plays a multifaceted role in building and nurturing the startup ecosystem across various sectors, including technology, healthcare, social innovation, and rural entrepreneurship. Kerala's startup ecosystem has shown significant growth over the years. The number of startups increased from 800 in 2017-18 to 7,100 in 2025-26 (till August). Incubation spaces went up from 1.5 lakh sq ft to 6.3 lakh sq ft in this period. Over the same period, employment increased from 28,000 to more than 65,000, and investment increased from Rs 280 crore to Rs 6,057 crore.

A notable development is the growth of inclusive technological solutions that address local needs. Examples include mobile-based agricultural advisory apps for farmers, healthcare tele-consultation services for rural clinics, and localised AI models that support native languages. Startups and IT firms focusing on social innovation also receive support from KSUM, where inclusive solutions are funded and nurtured.

Agencies Providing IT Services to the Government and General Public

Kerala State Information Technology Mission

The Kerala State IT Mission is an autonomous Government agency responsible for implementing IT initiatives on behalf of the Department of Information Technology, Government of Kerala. The major initiatives and achievements of the Kerala State IT Mission are the following.

e-Governance. A major feature of Kerala's IT sector is its strong focus on e-governance and the large number of initiatives that cover all aspects of governance and all categories of stakeholders. Under the policy Internet Is My Right, Kerala has digitised 1,666 Village Offices and integrated over 900 online services. The e-Sevanam portal and m-Sevanam app provide Government services directly to citizens, ensuring that farmers, students, pensioners, and businesses have real time access to essential services. With a fully digital land information system and revenue services available remotely, Kerala has become a national model for e-governance.

State Data Centre. The State Data Centre has about 4,000 virtual servers, about 560 applications, and about 500 servers set up by various departments. State Data Centres (SDCs) form the core of the e-governance framework in the State, hosting applications and websites of Government entities and providing related services. The current storage capacity of the State Data Centre is 2,500 TB. Expansion of the server farm area and other renovation work are underway in 4,000 sq ft at the State Data Centre–2 at Technopark. As part of cloud infrastructure upgrades, 8 servers and 300 TB of storage capacity were added in SDC2, and 1,020 virtual machines were provided to departments. A 10 gbps KFON connection has been established between SDC1 and SDC2, and an additional 4,000 sq ft area has been added in SDC2.

e-Office. This system aims to conduct office procedures electronically, transforming Government offices into paperless offices and bringing the benefits of digital communication that lead to faster decision making. The latest version of e-Office (7.2.5) has been launched and implemented across the State. E-Office is now operational in more than 90 per cent of Government offices.

KSWAN. Kerala State Wide Area Network (KSWAN) is a state-of-the-art Optical Fibre Communcation based network and backbone of the State Information Infrastructure (SII), connecting all Districts, 152 Block Panchayats, 63 Mini Civil Stations, and revenue towers across the State. Around 4,000 offices of Government departments are connected to KSWAN through wireless connections, and many more are linked through leased lines and LAN.

Public Wi-Fi. The State has 2,023 public Wi-Fi hotspots that provide free internet to citizens. The daily data consumption has reached 8 TB per day, and had over 60 lakh users in 2024-25. District administrations identify hotspot locations, including bus stands, tourist places, parks, public areas, Jana Sevana Kendras, and Government offices.

e-District. This is a State mission mode project under the National e-Governance Plan. It delivers high-volume services at the District-level and provides online access to various services through Akshaya centres or the public portal, streamlining the application and approval process for citizens. The total number of applications received and processed has crossed 10 crore. E-District provides 23 revenue certificate services and 13 Forest and Wildlife services online across the State, allowing citizens to apply for certificates and receive digitally signed certificates.

e-Government Procurement (e-GP). e-GP has been rolled out in the State, mandating all Government Departments, Boards, Universities, and organisations adopt e-tendering for all tenders. The Government of Kerala's e-tender portal has been recognised as one of the best-performing State portals by the Department of Expenditure, Ministry of Finance, and the Ministry of Electronics and Information Technology. It also received the SKOCH Award for e-governance for the year 2023-24.

e-Sevanam and m-Sevanam. The Kerala e-Service portal, e-Sevanam, launched as a good governance initiative, uses technology to bring almost all online Government services (G2C and G2B) onto a single platform. Launched in 2021, e-Sevanam and m-Sevanam have expanded to include about 917 services of 81 Departments. It won the Technology Sabha e-Governance Award 2023 for excellence in service delivery through e-Sevanam and the Governance Now National Award in July 2024 in the category of Digital Accessibility and Integration.

Akshaya. Akshaya is an innovative project launched in 2002 to bridge the digital divide. It operates in a public-private participation mode. In its early stages, the project aimed to make at least one person in each family e-literate. Over time, the focus shifted to a citizen-service-centric approach. Akshaya acts as the enrolment agency for Aadhaar enrolment. As on August 31, 2024, a total of 2,986 Akshaya centres are functioning across the State, providing employment to 10,518 persons. About 91 per cent of Social Security Pension mustering is completed through Akshaya Kendras.

Centre for Development of Imaging Technology (C-DIT)

C-DIT, established in 1988, is an autonomous body under the Department of Electronics and IT, Government of Kerala. Major achievements of C-DIT from 2021-22 to 2024-25 include the production and supply of 90 crores of hologram-embedded security tax labels for Kerala State Beverages Corporation; over 800 videos for various Government departments; digitising 482 lakh pages of documents; delivering IT and ITES courses through over 350 educational partners, including for SC and ST youth; developing software for the online examinations for Kerala Engineering and Pharmacy courses; and customising software for the online examination system for the Kerala Public Service Commission.

IT Infrastructure

Kerala State IT Infrastructure Limited (KSITIL). KSITIL is the execution agency for all construction and connectivity activities under the Electronics and Information Technology Department, Government of Kerala. KSITIL has executed infrastructure works for Technopark, Infopark, Cyber Park, Kerala Startup Mission, and Digital University. Major projects being implemented include the following.

IT Corridor. The Government of Kerala has given Administrative Sanction to establish four IT corridors, parallel to NH 66, from existing IT centres in Kerala. These are from Technopark Phase-III to Kollam, Cherthala to Ernakulum, Ernakulum to Koratty, and Kozhikode to Kannur. KSITIL has been designated as the Special Purpose Vehicle for this project.

Infrastructure for KSPACE. KSITIL has been entrusted with the construction of a building for the proposed Rural Dedicated Industrial Estate for Space sector at Technocity, Thiruvanathapuram.

Kerala Fibre Optic Network (KFON)

Kerala is the first State in the country to make internet a basic right**.** The Government introduced the Kerala Fibre Optic Network (KFON), a dedicated fibre-optic cable network that connects Government offices, educational institutions and homes. The Government of Kerala aims to provide seamless internet connectivity to Government offices and free internet connectivity to 20 lakh economically backward households. This project utilises the existing power infrastructure of Kerala State Electricity Board Limited (transmission network, distribution poles, and power substations) to lay fibre and establish the network. As on August 31, 2025, 73,134 families, 23,163 Government offices, 76,168 Commercial FTTH connections and 3,034 SME connections have been connected through KFON.

KSPACE

Kerala Space Park is the Government of Kerala's initiative to make the State a production hub for space, aerospace, and defence-related products and services, utilising both experienced professionals and fresh graduates from Kerala. The vision for KSPACE includes the following projects: Space Tech Industry Cluster, Pallippuram, Thiruvananthapuram; Liquid Propulsion and Allied Systems Complex, Valiamala; Aerospace Control Systems Complex, Veli; Aerospace Industry Cluster, Kochi; Aerospace Composite Centre, Thonnakkal; and Integrated Defence Industrial Park (IDIP). About 38 aerospace companies in Kerala are now affiliated with KSPACE.

Education and Human Resource Development

Kerala University of Digital Sciences, Innovation and Technology

The Government of Kerala upgraded the Indian Institute of Information Technology and Management, Kerala (IIITM-K) to establish the Kerala University of Digital Sciences, Innovation, and Technology (DUK). The university is designed to become a unique centre of excellence with global repute, offering education, research, and extension activities in digital technologies, science, and humanities. It aims to build capacity through Master's and Doctorate programmes in areas such as Artificial Intelligence and Natural Language Processing, Internet of Things, Electronic Systems and Automation, Imaging Technologies, Data Analytics and Big Data, Cyber Security, Blockchain, Ecological Informatics, and Geospatial Analytics. The major achievements of DUK are as follows:

Women Incubation, Startups and Entrepreneurship (WISE) Scheme. Through this programme, new women entrepreneurs are supported to launch their own businesses. About 10 startups which focus on sustainable eco-friendly products, education - course guidance, career guidance and coaching for Government job exams, e-commerce, and fintech, have been supported.

Digital Science Park. The university is implementing the Digital Science Park, the first in the country. About 13.6 acres of land has been identified, and the total estimated cost of the project is Rs 1,515 crore, of which Rs 212.9 crore will be funded by KIIFB. The Park will support industry and business units, as well as technology startups in areas like AI, robotics, electronics, smart hardware, and sustainable materials.

India Innovation Centre for Graphene (IICG). IICG is a collaborative project by the Ministry of Electronics and Information Technology (MeitY) and Government of Kerala. The Centre will focus on research and development, innovation, and capacity building activities, to act as a knowledge centre in the area of Graphene.

Graphene Aurora. Digital University and India Graphene Engineering and Innovation Centre (IGEIC, a Section 8 company) are set to implement the Graphene-Aurora programme– a collaborative project of the Ministry of Electronics and Information Technology (MeitY) and Government of Kerala, to nurture the emerging Graphene technology and innovation ecosystem.

International Centre for Free and Open-Source Software (ICFOSS)

The Government of Kerala has established ICFOSS in collaboration with Free Software Organisations in India and abroad to promote the development and application of free software and knowledge. Major achievements of ICFOSS include the following.

- LoRaWAN Gateway and Automated Rain Guage with Temperature-Humidity sensor were installed in all 14 Districts of Kerala.
- ICFOSS commissioned solar-powered automated weather stations (14) at Chittur.
- The LoRaWAN Messenger device is used for disaster management. ICFOSS also developed the IoT (Internet of Things)-enabled light energy harvester device, IoT-enabled energy harvester (water/air) devices, LoRaWAN Relay Technology, LoRaWAN Range Mapper Device, Wi-Fi based indoor air quality device, Wi-Fi based light management device, open

hardware smart plug, and solar-powered battery-operated LoRaWAN Gateway with 4G backhaul.

- ICFOSS commissioned the Centre for Open Hardware Lab.

Way Forward for Kerala's IT Sector

Kerala has specific advantages in certain aspects of its IT sector, which are being leveraged for future growth. Additionally, new trends in the sector are expected to support the growth of IT in Kerala.

Intelligent IoT systems and robotics development. Kerala has potential in the development of intelligent IoT systems and robotics. The State has a traditional ecosystem of electronics hardware industries, including one of India's largest Electronics PSUs, KELTRON. PSUs like BEL, startup ecosystems like the Maker Village, and companies such as Gen Robotics, Sastra Robotics, Win Wish, ECADS, and West Ghats are promising enterprises in this field. Both Thiruvananthapuram and Kochi offer strong growth potential for this market.

Precision manufacturing and aerospace industry. With the presence of the Indian Space Research Organisation (ISRO), Kerala accounts for more than 30 per cent of precision design and development in India. The space-related technology and engineering sector is already thriving, with over 300 small-scale businesses supplying to ISRO. If the potential of this industry is fully realised with the help of the newly established KSPACE, the precision manufacturing and space-tech industry can flourish further.

Extended Reality-backed creative industry. Kerala's traditional strength in creative content development can be harnessed to promote the Augmented Reality/ Virtual Reality/Extended Reality (AR/VR/XR) tech domain to the larger media and entertainment market. The State has introduced a new policy to support this area. Kerala's own CDIT can be promoted to lead the next-generation media and entertainment revolution. Promising startups like Tilt Labs, XR Horizons, and events like Kochi Design Week, along with educational institutions such as the Kerala Design Institute, can help build a robust ecosystem for creators.

Software products and services for tourism. The Kerala Institute of Tourism and Travel Studies (KITTS), an academy focused on tourism industry education and skills development, has partnered with Digital University Kerala. This partnership should be leveraged to build technological capabilities and skills in the State, alongside existing domain skills development in tourism.

Software products and services for healthcare. Kerala benefits from the presence of multi-specialty and super-specialty medical care. The State has strong potential to develop a comprehensive HealthTech sector with the backing of its medical and healthcare expertise. The presence of SCTIMST-TIMed, KSUM, and established healthcare IT providers, along with in-house capabilities within the healthcare system, can help Kerala gain a competitive advantage in this segment.

Private investment in IT infrastructure. The State is also seeing growth in private investment in IT infrastructure. The private sector is collaborating as co-developers or emerging as standalone developers of IT parks. This growth has been supported by favorable policy measures.

Kerala is evolving its strategies to consolidate gains in the IT sector. Advances in Artificial Intelligence, now seen as a General-Purpose Technology, are expected to influence not only IT but also other productive sectors of the economy. In response, the Government of Kerala has introduced its new IT Policy 2026 to help the State adapt to these changes and ensure that the benefits of technology reach all sections of society. This policy aims to turn Kerala into a globally-recognised, innovation-focused knowledge economy with particular emphasis on inclusive development. The new IT policy, focuses on promoting 5G technologies, the responsible use of data, cloud-based services, and modern technologies, while also supporting Free and Open-Source Software. The policy aims to improve public service delivery through technology and to strengthen cybersecurity, ensuring safe and resilient digital systems.

The fourth industrial revolution, characterised by the convergence of digital, physical, and biological systems, is driving global digital transformation through technologies such as artificial intelligence, data analytics, blockchain, cloud and quantum computing, and genomics. These technologies have a profound cross-sectoral impact and, when used effectively, can drive positive change, address human development challenges, and support the achievement of sustainable development goals. Kerala is well positioned to lead in harnessing digital technologies for societal benefit.

Kerala's approach to IT development has consistently emphasised inclusion. The future of the ecosystem rests on decentralisation, empowerment, and equity. Through sustained investment in physical and human capital across social and geographic boundaries, the State is building an IT sector that is innovative, competitive, inclusive, and socially responsible. This ensures that the benefits of technological advancement are widely shared, while continued investment in infrastructure and talent supports long-term social progress and economic growth.

Chapter 17
Tourism

Kerala is one of India's most popular tourist destinations. Over the last decade, Kerala's tourism sector has recorded significant advances, shaped by clear policy orientation, public investment, and an emphasis on sustainability and quality. The policy of the Government of Kerala has helped Kerala emerge as an international front-runner in the sphere of Responsible Tourism.

Tourism is recognised by the State Government as playing an important part in income growth and economic development. In recent years, tourism development has focused on strengthening basic infrastructure at major destinations, diversifying tourism products and experiences, and improving visitor services through information and facilitation centres. Public initiatives have supported land- and water-based tourism, expanded accommodation capacity with active private sector participation, and enhanced the State's visibility in national and international markets. Alongside growth and diversification, the sector has prioritised environmental sustainability and service standards. Public policy seeks to reinforce the role of tourism in employment generation, heritage conservation, and inclusive economic development.

Departments/Institutions in the Tourism Sector

The Directorate of Tourism is responsible for the implementation and monitoring of projects, and regulation of the tourism industry in Kerala. Kerala Tourism Development Corporation (KTDC), Kerala Tourism Infrastructure Ltd (KTIL), Bekal Resorts Development Corporation Ltd. (BRDC), Directorate of Eco Tourism, and the Kerala Responsible Tourism Mission Society are the other agencies involved in tourism activities in Kerala. The major arms for human resource development in tourism are the Kerala Institute of Tourism and Travel Studies (KITTS), State Institute of Hospitality Management (SIHM), and Food Craft Institutes (FCIs).

Policy Initiatives in 13th and 14th Plans

From 2016-17 to 2024-25, Plan expenditure in the tourism sector was Rs 2,360.7 crore.

The focus of 13th Five-Year Plan was on increasing employment opportunities and tourist arrivals through the introduction and strengthening of tourism products, human resource development, responsible tourism, and Government support through the involvement of other departments in tourist activities. The objectives of 14th Plan included the upscaling of destinations for high quality visitor experience, creating unique, innovative and diverse products and a conducive environment for investment in the tourism sector, adopting sustainable practices in tourism development, creating regulatory frameworks for tourism businesses, developing skilled resources for the tourism and hospitality sector, innovative mechanisms for tourism data management, promoting public-private partnerships (PPPs) in destinations, products, business development, and investment attraction.

The State Government has effectively used policy to improve the tourism sector, and adapt to emerging sector requirements. Some of the significant initiatives include:

Kerala Tourism Policy. The Kerala Tourism Policy 2017 was introduced to promote sustainable and inclusive tourism, aiming to position Kerala as a premier global destination. It emphasises responsible tourism, green protocol implementation, participation of people with disabilities and the transgender community in tourism-related activities, establishing an investment cell, and creating new marketing policies.

Caravan Tourism Policy. Introduced in October 2021 to promote off-beat tourism by facilitating caravan-based travel and caravan parks in the State, especially in areas not traditionally accessible to conventional tourists. Currently, 14 caravans are operational across the State and a caravan park has been commissioned in Vagamon. Other parks are being developed in Bekal in Kasaragod and Bolgatty Palace Hotel in Ernakulam (in collaboration with KTDC). Another caravan park is under development in Ponmudi in Thiruvananthapuram District (also led by KTDC).

Kerala State Design Policy. Prepared by the Department of Tourism and the Public Works Department and introduced in March 2024, it aims to boost the State's design-based economy through innovation, cultural preservation, and improved public infrastructure. It promotes inclusive, tech-driven tourism destinations and supports local artisans while positioning Kerala as a global design hub.

Heli Tourism Policy. Approved in December 2024, it is a pioneering initiative aimed at enhancing luxury travel and improving connectivity across Kerala's diverse tourist destinations. The policy envisages infrastructure development for heli tourism such as heliports, heli-stations, and helipads, through PPP. The initial phase of

the Heli Tourism project was inaugurated on December 30, 2023 at Cochin International Airport Limited (CIAL).

Cruise Tourism Policy. The Department of Tourism has finalised a new cruise tourism policy in April 2025, marking a significant step towards transforming the State into a premier cruise destination. This initiative aims to leverage Kerala's extensive coastline and rich cultural heritage to offer unique maritime experiences to both domestic and international tourists.

Foreign Tourist Visits (FTVs) in Kerala

Kerala witnessed steady growth in FTVs from 2015 to 2019, despite the severe floods in 2018. The Covid-19 pandemic led to a drastic fall in FTVs in 2020 and 2021. FTVs were just 0.6 lakh in 2021, marking the lowest foreign arrivals in a decade. A strong recovery began in 2022, with a 471.3 per cent surge as travel restrictions eased, bringing FTVs to 3.5 lakh. The upward trend continued thereafter. FTVs reached 8.2 lakh in 2025 (Figure 17.1).

Foreign tourist visits to Kerala display a clear seasonal pattern, with peaks occurring from January to March, and again from October to December. These months consistently recorded higher tourist arrivals, indicating a preference for Kerala's pleasant climate and the festive season during these periods. In contrast, the months from May to July experienced a noticeable dip in foreign arrivals, marking this the off-season.

Kerala consistently attracts a high volume of international tourists from Europe, Middle East, Asia-Pacific, and North America. The top five countries from where tourists came to Kerala are United Kingdom, United States of America, France, Germany, and Saudi Arabia. Europe, especially the United Kingdom, led across most years, with arrivals peaking above 2 lakh in 2018 and reaching over 1.1 lakh in 2024. Canada, Germany, and France also contributed notably. The United States of America had close to one lakh tourists arriving in Kerala in 2024, showing consistent year-on-year growth since 2021. The Middle Eastern countries like Oman, Saudi Arabia, and the United Arab Emirates have displayed stable flows. Tourist arrival from Maldives and Malaysia saw fluctuations, but the numbers are significant. Other significant contributors included Italy, Russia, and Singapore.

There are District-level variations in foreign tourist arrivals to Kerala. Ernakulum consistently led in visits, peaking at 5.2 lakh in 2019 and maintaining its lead with 2.7 lakh in 2024. Thiruvananthapuram followed with 1.7 lakh tourists in 2024. Idukki saw a remarkable post-pandemic revival, with foreign tourist arrivals reaching a record of 1.4 lakh in 2024. This reflects increased interest in eco-tourism and hill station experiences. Alappuzha and Kottayam have shown steady gains in backwater tourism. In contrast, Pathanamthitta, Kollam, Palakkad, and Kasaragod remained at the lower end in terms of tourist volume. Kozhikode,

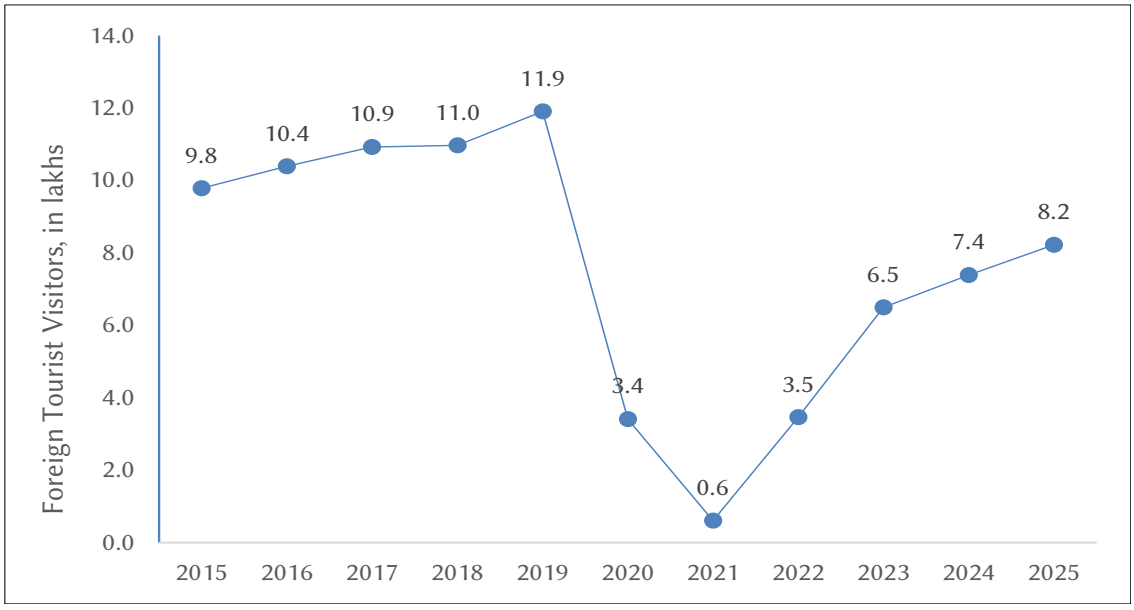


Figure 17.1 *Foreign tourist visits to Kerala, 2015 to 2025* numbers in lakh
Source: Department of Tourism

Malappuram, and Thrissur recorded moderate but consistent gains in foreign tourist numbers.

Domestic Tourist Visits (DTVs) in Kerala

Kerala saw a consistent rise in domestic tourist visits, growing from 124.7 lakh in 2015 to 183.8 lakh in 2019, with strong annual growth. However, the Covid-19 pandemic caused DTVs to fall sharply to 49.9 lakh in 2020, marking the lowest domestic turnout in the decade. A recovery began in 2021. DTVs accelerated in 2022, with 150 per cent growth to reach 188.7 lakh, surpassing the pre-pandemic peak. Visits reached 250.6 lakh in 2025. Overall, Kerala's domestic tourism sector has not only recovered post-pandemic, but has also surpassed historical highs. (Figure 17.2)

Domestic tourist visits to Kerala show relatively less seasonality than FTVs, with a more even distribution of visitors across the months. However, the summer season (March to May) consistently attracts the highest number of domestic tourists, followed by the winter season (December to January). The relative off-seasons are February to March, and June to July months.

Kerala has witnessed a steady rise in domestic tourist arrivals, from both within the State and from neighboring States. Tourists from within Kerala made up the largest share, growing from 87 lakh in 2016 to 152.7 lakh in 2024. Tamil Nadu followed, growing from 10.8 lakh to 23.4 lakh. Karnataka ranked third, showing a consistent upward trend from 7.8 lakh to 13.8 lakh. Maharashtra and Andhra Pradesh contributed 7.5 lakh and 4.3 lakh, respectively, in 2024. Among Union Territories, Lakshadweep stood out with over 91,000 tourists visiting Kerala in 2024.

Central Kerala consistently attracted the highest number of domestic tourists. Led by Ernakulam, Idukki, and Thrissur, the region's total visitors increased from around 66 lakh in 2016 to over 114 lakh in 2024. South Kerala, comprising Thiruvananthapuram, Kollam, Pathanamthitta, and Alappuzha, showed impressive growth, with total domestic tourist visits increasing from about 29.5 lakh in 2016 to 55 lakh in 2024. North Kerala ranked third among the 3 regions in the case of DTVs, especially Kasaragod and Palakkad Districts.

Economic Impact of Tourism

Foreign and domestic tourists spend on transportation, accommodation, food and beverages, shopping, and other services. Tourist spending from 2015 to 2019 showed a steady increase of 68.6 per cent. In 2020, the earnings from tourism declined due to the Covid-19 pandemic. The State has recovered strongly and by 2025, earnings from tourism increased to Rs 50,702.3 crore, surpassing pre-pandemic earnings in 2019. (Figure 17.3)

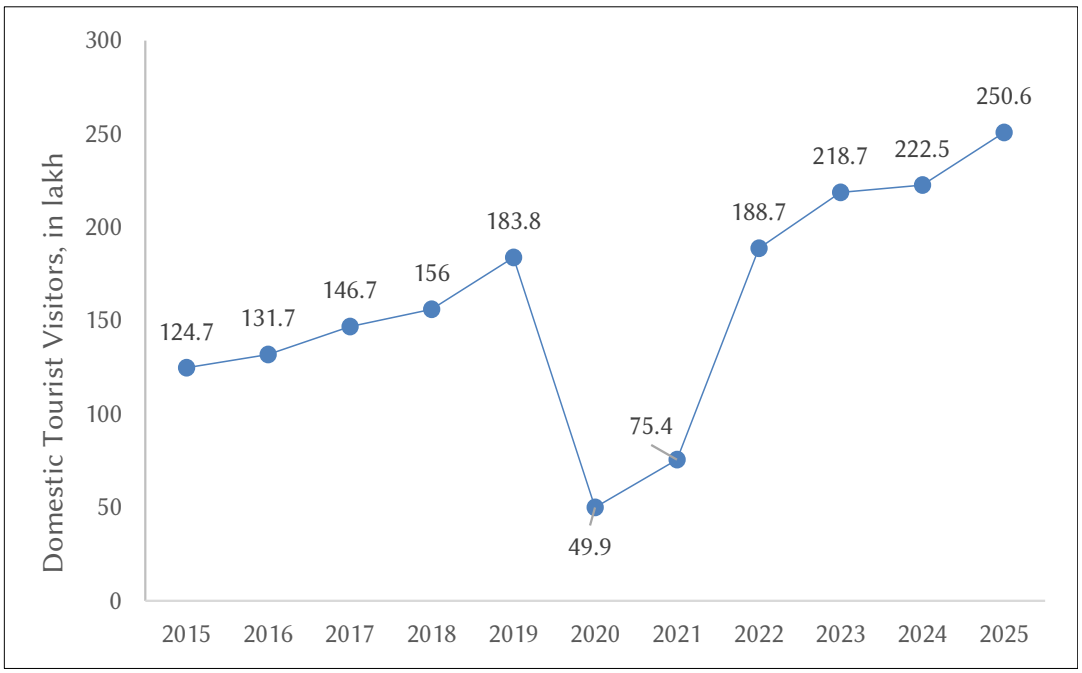


Figure 17.2 *Domestic tourist visits to Kerala, 2015 to 2025* numbers in lakh
Source: Department of Tourism

Significant Initiatives and Achievements of the Department of Tourism

Attracting investments

Tourism investors meet. The first edition of the Tourism Investors Meet (TIM) was organised by the Department of Tourism in November 2023 at Thiruvananthapuram. With the participation of nearly 500 investors and entrepreneurs, including 46 startups and 118 investors from the tourism sector, TIM 2023 showcased 75 private projects and 23 Government initiatives, pledging a total investment of Rs 15,126.7 crore. TIM has laid a strong foundation for long-term, sustainable tourism development by encouraging private participation and innovation.

B2B and B2C meet. Conducting international, national, and domestic meets have facilitated interactions with potential travellers and tour operators, the promotion of tourist destinations, and attracted investments in Kerala tourism.

Showcasing State tourism

Kerala has gained international recognition for its innovative marketing campaigns in responsible and sustainable tourism practices.

- *Yalla Kerala.* In its bid to draw Arab tourists to the State, this campaign was launched in important West Asian markets of the United Arab Emirates, Saudi Arabia, Bahrain, Kuwait, Qatar, and Oman, in 2017.
- *Human by Nature.* This campaign launched in 2019 aims to showcase the unique way of life in Kerala and celebrates humanity through real-life stories set across various terrains.
- *Make up for lost time, pack up for Kerala.* This campaign launched in 2022 targeted domestic tourists and gave an impetus to the transition to normalcy, post Covid.
- *Holiday Heist.* This campaign launched in 2023 had a month-long bidding game conducted on the department's WhatsApp chatbot, Maya, where participants could bid for tour packages to Kerala's destinations at low prices.
- *Look East.* This campaign was launched in 2025, in partnership with Malaysian Airlines, to attract tourists from East Asian markets focusing on countries including China, Japan, Malaysia, Australia, Indonesia, New Zealand, Vietnam, and Laos
- *Come Together in Kerala.* This campaign launched in 2025 aimed at encouraging urban families to visit Kerala and reconnect in its serene landscapes.
- Kerala Tourism has been participating in regional, national, and global marketing programmes. It

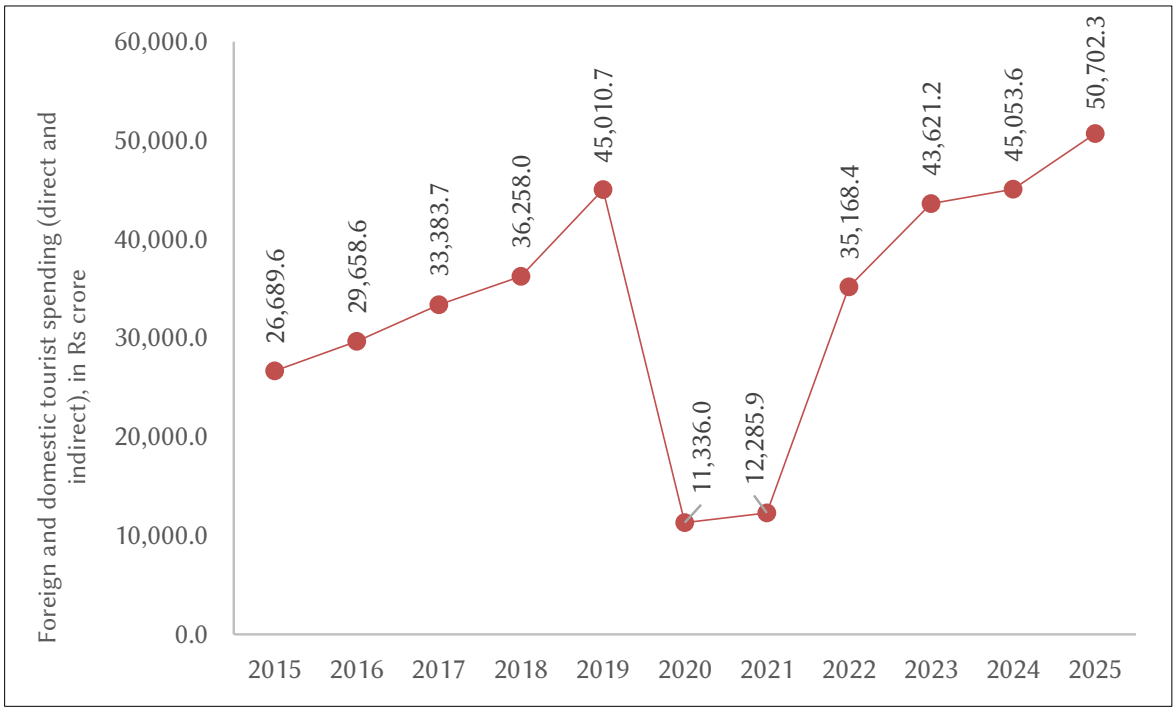


Figure 17.3 *Foreign and domestic tourist spending (direct and indirect), Kerala, 2015 to 2025* in Rs crore
Source: Department of Tourism

also provides financial support for various events and programmes based on social media, website activity, and public relations activities. As a result of the timely showcasing of new products and new-age digital marketing, Kerala Tourism's Facebook page, Instagram account, and X accounts have high engagement.

Developing infrastructure

Destination challenge. This is a flagship initiative by Kerala Tourism aimed at realising the ambitious goal of One Panchayat One Destination by 2026. This programme encourages the development of unique tourism destinations in each Local Self-Government (LSG) area, promoting decentralisation and grassroots participation in tourism development. So far, 41 projects have been sanctioned, with one project each successfully completed in Ernakulam and Malappuram Districts.

Tourism hub. As part of transforming Kerala into a world-class tourism hub, steps are being taken to develop infrastructure at the major beaches of Kerala, make them garbage-free, implement heli tourism, wedding tourism, cruise tourism, heritage tourism, caravan tourism, promote adventure tourism, organise national/international fairs, construction of food streets, and development of tourism corridors.

Construction and renovation of guest houses. In order to provide good quality accommodation facilities at a low cost to tourists visiting major destinations in Kerala, guest houses are being upgraded. An accommodation complex was completed in Munnar and opened to guests in January 2025. The renovation of the old building of the Sultan Bathery Guest House in Wayanad was completed and opened to guests in December 2024.

Exclusive interventions

Cine tourism. This project is to develop tourism infrastructure around cinematic landmarks started with the development of the Kireedam Bridge in Thiruvananthapuram, as part of the broader vision to attract cinema enthusiasts and travelers to relive memorable film moments in real-world locations.

Nightlife tourism. This initiative is aimed at enhancing tourist engagement during evening hours and offering culturally immersive experiences. As part of the first phase, infrastructure has been developed to showcase Kerala's traditional arts, cuisine, and cultural performances in Kanakakunnu Palace in Thiruvananthapuram. Additionally, the Department is implementing the Travancore Heritage Project to further promote nightlife tourism, with a vision to expand such initiatives to other vibrant cultural spaces such as Manaveeyam Veethi.

Adventure tourism. The Department of Tourism has entrusted the Kerala Adventure Tourism Promotion Society (KATPS) to create guidelines for adventure activities, organising festivals and competitions, operating adventure parks and developing academies to provid train youth and staff in the adventure tourism sector. Currently, floating bridges are operational in Beypur, Kozhikode; Muzhuppilangad, Kannur; Thanur, Malappuram; Bekal, Kasaragod; Varkala, Thiruvananthapuram; Chavakkad, Thrissur; and Kuzhippilly, Ernakulam. Glass bridges have become operational at Vagamom, Idukki and Akkulam, Thiruvananthapuram. Major activities in adventure tourism include the following.

- International Paragliding Festival at Vagamon, Idukki.
- International Surfing Festival at Edava and Vettakkada beaches in Varkala, Thiruvananthapuram.
- Malabar River Festival, an annual four-day white water kayaking championship on the Iruvanjhipuzha and Chalipuzha rivers in Kozhikode.
- Chaliyar River Paddle, the first source-to-the-sea paddling event in the country, for the last ten years.
- Beypore International Water Fest, organised in 2022, 2023 and 2024 to give a new direction to water adventure tourism in Kerala.
- Kannur Kayakathon, an amateur kayaking competi tion organised annually from Parassinikkadavu to Valapattanam in the Valapattanam River in Kannur.
- Pinarayi River Festival, organised annually in the Ancharakandi River in Dharmadam in 2022 and 2024.
- Kayaking Centre for the Malabar River Festival World Kayaking Championship at Arippara, Kozhikode, and the International Kayaking Centre at Pulikayam, Kodancherry for kayaking training and competitions, have been completed.
- Champions Boat League (CBL), one of the world's largest water festivals, this initiative was launched in 2019 to elevate the traditional *vallamkali* by presenting it in a professional league format. The Tourism Department has conducted five seasons of the Champions Boat League and formed a company named CBL Limited for efficient management. This

continues to attract large numbers of domestic and international tourists.

Circuits being made functional

Malabar Literary Tourism Circuit – Phase 1. This is a visionary project aimed at blending literary heritage with tourism by connecting key destinations in the Malabar region that are deeply associated with some of Malayalam literature's most iconic figures. The proposed circuit will link culturally and historically rich sites including the Tunchan Memorial**,** Beypore**,** Thasarak**,** Ponnani**,** Thrithala, and Nila Theeram.

Kollam Biodiversity Tourism Circuit – Phase 1. This is a major ecotourism initiative which covers key natural and cultural hotspots across Kollam District, including Ashtamudi, Munroethuruthu, Kottarakkara, Meenpidippara, Muttara Maruthumala, Jadayuppara, Thenmala**,** and Achankovil. The project aims to promote sustainable and biodiversity-based tourism while enhancing infrastructure and conservation in ecologically sensitive zones, with the vision of positioning Kollam as a premier destination for eco-conscious and culturally immersive tourism.

Region specific tourism

Muziris Heritage Project. The Muziris Heritage Project is one of India's largest conservation efforts aiming to preserve and showcase heritage of over 3,000 years in the region between North Paravur in Ernakulam District and Kodungallur in Thrissur District. It includes the restoration of ancient ports, religious sites, and the development of museums and cultural centres. In 2023, Kerala Tourism had completed 18 projects under the Muziris Heritage Project. To enhance tourist engagement, the Muziris Heritage Project introduced a Muziris Passport system that allows visitors to document their journey across various heritage sites, encouraging comprehensive exploration of the region's historical landmarks. A notable event, the Moothakunnam Muziris Tourism Fest, was held in April 2025, which featured cultural programmes, exhibitions, and interactive sessions aimed at promoting the heritage of the Muziris region.

Assistance from the Union Government. Under the four Union Government schemes namely Swadesh Darshan 2.0, Special Assistance to States for Capital Investment (SASCI), Development of Iconic Tourism Centres to Global Scale (under the Central Sector Scheme), and the Challenge Based Destination Development (CBDD), Kerala has received administrative approval for Rs 388 crore. The Department of Tourism has entrusted KATPS to manage and operate the adventure park at Vagamon established under Swadeshi Darshan Scheme of Government of India.

Roles of Other Agencies in Promoting Tourism

Kerala Tourism Development Corporation

The Kerala Tourism Development Corporation (KTDC) operates an extensive network of hotels, ranging from budget-friendly to luxurious heritage properties, such as the Bolgatty Palace. Significant achievements include -

Mission Face Lift. In 2020, the economy class properties of KTDC were given a strategic facelift and repositioned as budget destination properties. The properties were rebranded as land-based properties in line with the geographic location of each property. This repositioning enhanced the brand image of the properties and improved the overall revenue and average room revenue. Chaithram, with its strategic location advantage, was repositioned to Grand Chaithram, and in the year 2024, the property has achieved 3 star classifications. The occupancy rate, which was 44 per cent in 2019-20, rose to 88 per cent in 2024-25. Water Scapes, Kumarakom, the premium back water resort of KTDC underwent major renovation and repositioning during the Covid-19 pandemic, and the upgraded Water Scapes was re-opened in 2021. KTDC has inaugurated a new property on February 25, 2026 at Muzhippilangad in Kannur.

Enhancement of visibility and aggressive sales of KTDC properties. Anticipating a downfall of the conventional travel agent business, initiative was taken to integrate KTDC properties on different Online Travel Agents (OTA) platforms. The number of rooms sold through OTA platforms made a remarkable increase from 10,140 in 2016-17 to 46,663 in 2023-24. The total online sales for 2023-2024 including, KTDC Online, was 58,627 room nights.

Introduction of channel management software and Revenue management with dynamic pricing. KTDC introduced Channel Management**,** software to provide seamless integration with various online travel agents such as booking.com and, Make My Trip and also introduced Revenue Management with dynamic pricing in select KTDC premium properties. The yearly occupancy rate of KTDC premium properties increased from 44 per cent in 2019-20 to 65.9 per cent in 2023-24, and that of KTDC budget properties from 42 per cent to 60.7 per cent.

Advance collection and settlement scheme. This scheme was started with Make My Trip in December 2019, and an amount of Rs 22.1 crore was collected as interest-free advance payment to KTDC, for adjustment against future reservations. It was started with IRCTC in 2020 and collected an amount of Rs 1.5 crore for adjustment against future reservation.

Holiday home tie-up. Corporate tie–up offer minimum assured room night sales for selected KTDC properties. These include tie-ups with the Reserve Bank of India for Water Scapes (200 room nights), with NABARD for Water Scapes, Samudra, and Tea County for 1,200 room nights, and with Indian Oil Corporation Ltd. at Tea County (1,825 room nights per year).

Responsible Tourism Mission Society

The Responsible Tourism (RT) initiative began in 2007 and was expanded into the Responsible Tourism Mission under the Department of Tourism in 2017. It promotes sustainable, community-based tourism that benefits local communities while preserving the environment and cultural heritage. The Kerala Responsible Tourism Mission Society (KRTM Society) was registered in October 2023 and has been functioning independently since April 1, 2024. It serves as the State Nodal Agency designated by the Ministry of Tourism, Government of India, for implementing rural tourism, sustainable tourism, and rural homestays.

The major projects of the RT Mission include training and skill development, experiential tourism packages, participatory tourism development initiatives, the Model RT Village Project, Kerala Agri Tourism Network, Experience Ethnic Cuisine Project, Women-Friendly Tourism Initiative, Beypore RT Integrated Development Project, Kerala Responsible Tourism Network, RT Art and Cultural Forum, and the HR Directory. At present, 140 experiential tourism packages are operational, linking 850 families. The STREET (Sustainable, Tangible, Responsible, Experiential, Ethnic Tourism) project is being implemented in 10 locations, aligned with the UNWTO motto of Tourism for Inclusive Growth. The PEPPER (Peoples' Participation for Participatory Planning and Empowerment through Responsible Tourism) project encourages LSGs to develop tourism proposals, with Vaikom and Ponnani identified as pilot destinations.

The Model RT Village Project aims to develop selected locations into fully responsible tourism destinations. Aymanam is Kerala's first Model RT Village, and the project is underway in 15 other LSGs. Under this initiative, 1,544 farmers have been trained, 102 agri-tourism units are operational, and 2,800 families are part of the ethnic cuisine experience network.

The Women-Friendly Tourism Initiative has created a network of 1,50,000 women community members and aims to generate 30,000 new jobs through 10,000 women-run tourism enterprises. A State-wide gender audit is being conducted in collaboration with UN Women India. Safety assessments have been completed in 78 destinations, and the first Global Women Conference on Gender-Inclusive and Responsible Tourism was held in Munnar in November 2024. The Beypore RT and Textile Art Fest, organised in February 2024, brought together tourists, artists, and artisans from within and outside Kerala — particularly textile artists from across India — to promote Beypore as a responsible tourism destination.

Currently, 25,015 individual and group units are registered with the RT Mission, including 17,884 women-owned or women-led units. These span sectors such as handicrafts, farming, farm supplies, art and artisan services, RT chauffeurs, community tour leadership, farm and home stays, tended accommodation, and ethnic cuisine units. Around 1,50,000 families are directly or indirectly linked to tourism and earning income, and since its inception, the Responsible Tourism initiative has generated Rs 123.9 crore in revenue.

Kerala Tourism Infrastructure Limited

Kerala Tourism Infrastructure Limited (KTIL) has played a pivotal role in strengthening Kerala's tourism landscape through infrastructure development, public–private partnerships, and sustainable initiatives. KTIL has implemented ecotourism projects at the Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), Palode, and the Ponmudi Tourism Destination, promoting tourism in ecologically sensitive areas. Under the PRASHAD Scheme, it has upgraded facilities at the Guruvayur Temple, including a tourist facilitation centre, amenity centre, multi-level car parking, and related infrastructure. KTIL also prepared the tourism plan for Kerala's coastal regions as part of the Coastal Zone Management Plan, 2019.

As part of transforming Veli into a tourism hub, KTIL completed the Tourist Facility Centre, Convention Centre, and the conceptualisation of an Urban Wetland Nature Park. It has prepared

comprehensive infrastructure investment plans for the North Malabar region, identifying tourism and investment interventions in 28 potential areas; the master plans have been approved by the Government. The first phase of the Madavoorpara Tourism Zone, coordinated by KTIL, has been inaugurated, with an additional 1.3 acres acquired for further facilities. KTIL has also initiated the Kadinamkulam–Anchuthengu Backwater Tourism Corridor to harness backwater tourism potential in Thiruvananthapuram District. Boat jetties at three locations are complete, with work nearing completion at a fourth. This project represents a strategic initiative to enhance Kerala's inland waterway tourism potential, and all preparatory studies are in the final stages.

KTIL has prepared Kerala Tourism Version 2.0, redefining the State's tourism vision and strategies in line with global trends. Hop-on-Hop-off boats and water taxis introduced in Kochi and Muziris have enhanced water-based transport and tourism experiences. Under urban renewal initiatives, KTIL is developing WE-Parks (Wellness and Entertainment Parks) beneath over-bridges across the State; Bridge Vibes, Kollam, located under a railway bridge near SN College, was inaugurated in March 2025.

A Tourism Investment Facilitation Cell has been established at KTIL's Thiruvananthapuram office to streamline proposals from the Tourism Investors Meet and accelerate project implementation. KTIL has also played a key role in formulating the Caravan Tourism Policy, Kerala State Design Policy, Heli Tourism Policy, and Cruise Tourism Policy for the State.

Bekal Resort Development Corporation

The Bekal Resorts Development Corporation (BRDC) is a public sector undertaking under Department of Tourism actively engaged in several initiatives to bolster tourism in the Kasaragod District.

The Indian Hotels Company Limited (IHCL), under the Tata Group, has expanded its presence in Bekal with the launch of a 151-room property in December 2024 featuring extensive facilities for destination weddings and Meetings, Incentives, Conferences, and Exhibitions (MICE) tourism. Another 150-room budget-friendly Ginger Hotel is under development at Udma Pallam. These properties operate on land leased from BRDC, aligning with the Corporation's strategy to promote Bekal as a premier destination for weddings and conferences. The Bekal Cultural Centre in Thachangad serves the community as a cultural centre, accommodating large gatherings and intimate celebrations and is known for its customisable packages and services, making it suitable for weddings, birthday parties, and corporate events. BRDC organises Bekal Beach Festivals which attracted thousands of visitors.

Directorate of Ecotourism

The Directorate of Ecotourism, in collaboration with the Kerala Forest Department and other stakeholders, has implemented several initiatives to promote sustainable and community-based tourism across the State. In 2016–17, it conducted skill development training for 20 Scheduled Tribe members through KITTS, supported the Angamoozhi–Gavi Jungle Safari with three buses, renovated the Children's Park, and developed a Light and Sound Show at the Thenmala Ecotourism Project. The International Mountain Cycling event was organised in 2017 with the Wayanad DTPC and Wayanad Tourism Organisation.

During 2017–18, accommodation facilities were renovated at Meesapulimala, Rodowali, and Silent Valley, a micro-website was developed to promote eco-adventure tourism, and carrying capacity studies were conducted for various ecotourism destinations. The Jadayuppara project was opened to visitors in 2018, followed by ecotourism development at Arippa in Thiruvananthapuram district in 2019–20. The musical dancing fountain at Thenmala was renovated in 2021–22.

In 2023–24, the Rodomansion project was implemented in Munnar through KFDC, and the Kattakada Thungampara project was completed. Ecotourism activities have begun at Munderikadava in Kannur District, while carrying capacity studies and restoration works are underway at Nelliyampathy through KITTS. A Forest Café has also been constructed at Vellappara in Idukki District under the Forest Department.

Kerala Institute of Tourism and Travel Studies

The Kerala Institute of Tourism and Travel Studies (KITTS) is dedicated to providing education, training, research, and consultancy services in the travel, tourism, and hospitality sectors. KITTS also provide training and capacity building programmes for various stakeholders of the tourism industry, and undertakes research and consultancy studies on various aspects of tourism development. KITTS has bagged the Metro Expedition Tourism Award for its outstanding contribution to tourism education in 2024. International Training Centre and Amphi Theatre was inaugurated in 2017

and a new academic block was inaugurated in 2024 which expanded student facilities. KITTS has signed agreement with Digital University Kerala in 2024 and received approval to offer a Master of Travel and Tourism Management course affiliated to University of Kerala from the 2025-26 academic year. KITTS started a B.Com (Travel and Tourism) course, affiliated to University of Kerala in 2019, and Advanced Diploma in Tourism Management and Diploma in Tourism Entrepreneurship Courses in Hybrid Mode in 2024. KITTS has started publishing a news journal titled Kerala Tourism Insights on behalf of Kerala Tourism in 2024.

State Institute of Hospitality Management

The State Institute of Hospitality Management, Kozhikode is functioning under the Department of Tourism, Government of Kerala with support from the Ministry of Tourism Government of India, and plays a significant role in training professionals for the hospitality industry. The Institute currently offers a B.Sc. Degree in Hospitality and Hotel Administration and a Diploma programme in Food Production. Free training has been given in the Traditional Snack cum Savory Maker and Multi Cuisine Cook Programmes under the Women Empowerment scheme. Training programmes are provided for various departments including the Industries Department and Kerala Institute for Research Training and Development Studies of Scheduled Castes and Scheduled Tribes (KIRTADS) and under the Union Government's Hunar Se Rozgar scheme. A boys' hostel with space for 95 students was opened in December 2021, and a language lab and a computer lab were set up to help students improve their language skills in 2024–25.

Food Craft Institute

The Food Craft Institute (FCI) Kerala established jointly by the Government of India and Government of Kerala in 1967 was brought under the Department of Tourism with the aim to support the tourism hospitality industry by providing highly skilled manpower. The Institute currently has 13 Centres across Kerala and the courses currently offered are Front Office Operation, Food and Beverage Service, Food Production, Bakery and Confectionery, Hotel Accommodation Operation, and Canning and Food Preservation. FCI provides training at affordable rates to lower income families to open up employment opportunities in the tourism industry. It collaborates with other Government agencies such as Kudumbashree, ASAP, Prisons, and other Union and State Government Organisations in implementing skill development activities through various programmes.

Emerging Stakeholders in Kerala Tourism

Over the past decade, several new agencies have made significant contributions to the growth and diversification of tourism in the State. Departments such as Forest, Irrigation, Kerala State Road Transport Corporation (KSRTC), Kerala State Electricity Board (KSEB), State Water Transport Department (SWTD), and Kerala Shipping and Inland Navigation Corporation (KSINC) have worked together to strengthen Kerala's vision of inclusive, responsible, and diversified tourism.

The Forest Department has expanded ecotourism through well-managed forest trails, wildlife sanctuaries, and eco-lodges in destinations such as Thekkady, Parambikulam, and Wayanad. KSEB's Hydel Tourism initiatives have transformed dam sites including Idukki, Kakkayam, Banasura Sagar, and Kundala into eco-friendly tourism hubs with boating, nature trails, and scenic viewpoints. The Irrigation Department has developed tourism zones around reservoirs such as Karapuzha, Malankara, and Kallada, featuring walkways, gardens, and recreational spaces.

In collaboration with Kochi Metro Rail Limited, canal rejuvenation projects in Edappally and Chilavannur are underway, creating green spaces and walkways that enhance urban tourism and mobility. KSRTC has introduced Budget Tourism packages offering affordable, all-inclusive travel options across Kerala, while KSINC operates tourist boats and specialised cruises such as Nefertiti and Sagararani. The SWTD complements these efforts by providing affordable boat services and developing budget-friendly tourism packages.

Challenges

Tourism in Kerala faces the challenges of seasonality, with heavy dependence on specific months that have led to the underutilisation of tourism infrastructure in off-peak periods; increased footfall in ecologically sensitive zones such as hill stations and backwaters and pressure on natural resources; infrastructure gaps in rural and emerging destinations including last-mile connectivity, sanitation, and waste management; climate-related disruptions such as floods and unpredictable monsoons that impact tourist confidence, and operations; and human resource challenges, including the need for better-skilled service providers and multilingual guides.

Strategy

The Government of Kerala is addressing these challenges through coordinated policy action, stakeholder

Box 17.1
Awards and Recognitions for Kerala Tourism

International Awards

World Travel Market (WTM), London

- WTM Best Stand Award, 2023
- WTM Global Award for Best Local Sourcing Craft and Food for RT Mission, 2023
- WTM Global RT Award for Conserving Water, Improving water scarcity and supply for neighbors, for Water Street by RT Mission, 2022
- WTM Responsible Tourism Award for Increasing Diversity in Tourism, One to Watch for Aymanam Model RT Village, RT Mission, 2021
- WTM Responsible Tourism Award for Meaningful Connections, Highly commended, for Responsible Tourism Mission Kerala, 2020
- WTM Best in Responsible Tourism Award, for Responsible Tourism Mission, 2018
- WTM Best for Managing Success Gold Award, for Kumarakom Responsible Tourism Project, RT Mission, 2018
- WTM Highly Commended Award, for Kumarakom Responsible Tourism Project, RT Mission, 2017

ICRT International

- Gold Award for Destination Building Back Better- Post Covid, 2022
- Gold Award for Increasing Diversity in Tourism- How Inclusive is our Industry?, 2022
- Gold Award for Reducing Plastic Waste in the Environment, 2022
- Gold Award for Conserving Water, Improving water scarcity and supply for neighbours, 2022

Pacific Asia Travel Association (PATA)

- Gold Award for Digital Marketing Campaign, WhatsApp Maya Holiday Heist – Online Contest, 2024
- Gold Award for Marketing Campaign (State and City - Global), Pack Up for Kerala, 2023
- Gold Award for Printed Marketing Campaign, Change of Air Campaign, 2022
- Gold Award for Women Empowerment in Tourism Sector, for Responsible Tourism Women Empowerment Activities at Kumarakom, 2019

Condé Nast

- Aymanam Model RT Village is listed as one of the must watch destination in 2022

National Awards

Ministry of Tourism, Government of India

- National Tourism Award, Best Responsible Tourism Village category, for Kadalundi, 2024
- National Tourism Award, Best Agri Tourism Village category, for Kumarakom, 2024
- National Tourism Gold Award, Best Rural Tourism Project, for Kanthalloor STREET Project, 2023
- National Tourism Award, Most Responsible Tourism Project/Initiative in the Hall of Fame section, for Wayanad, 2018

India ICRT Awards

- Gold Award, Employing and Up skilling Local Community, for Beypore RT project, in 2024
- Gold award, Best for Local Sourcing, Craft and Food, for VLE, 2023
- Gold Award, for plastic waste elimination and water conservation under the Water STREET Project, 2022

Others

- TOFTigers Sanctuary Asia Award for Kerala Tourism for its commitment to sustainable and responsible wildlife tourism, December 2024
- Metro Expedition Tourism Award for KITTS for its outstanding contribution to tourism education, 2024
- Traveller Review Awards, Kerala is ranked first in the'Most Welcoming Region in India, 2022
- Travel + Leisure Global Vision Award for Kerala Responsible Tourism Initiative, 2022
- Booking.com Traveller Review award for the Most Welcoming Region in India, 2022
- India Reader's Choice Awards for Best Wedding Destination, 2022
- Indian Responsible Tourism Award for the Best Future Forward State category for Kerala Tourism's Responsible Tourism Initiative, 2021.

engagement, and adaptive, future-oriented planning. Thrust areas of the emerging strategy include:

Year-round tourism destination. Kerala is becoming a year-round tourism destination by leveraging its diverse geography and supporting innovative tourism products.

Developing sustainable tourism destinations. Kerala is promoting sustainable tourism through eco-friendly practices such as renewable energy, waste management, water conservation, and electric vehicles. Tourist spots are being enhanced with informative signage, trained staff, and family-friendly amenities.

Prioritisation as MICE destination. Kerala's strategic location and excellent connectivity through four international airports (Thiruvananthapuram, Kochi, Kozhikode, and Kannur), major seaports, and an extensive road network make it an accessible and appealing destination for domestic and international MICE (Meetings, Incentives, Conferences, and Exhibitions) tourism.

Positioning as wellness and medical tourism destination. By showcasing its unique combination of traditional healing systems, Kerala holds significant potential as a global hub for wellness and medical tourism, modern healthcare infrastructure, and serene natural settings. Renowned as the place of origin of Ayurveda, Kerala offers authentic wellness experiences including Panchakarma treatments, yoga, meditation, and naturopathy, attracting health-conscious travellers from around the world.

Identifying appropriate market segments. Identifying appropriate market segments is essential for Kerala Tourism to effectively position itself in an increasingly competitive global travel landscape.

Way Forward

Kerala's tourism sector has demonstrated remarkable resilience and growth, successfully overcoming challenges such as the 2018 floods and the Covid-19 pandemic to emerge stronger and more inclusive. The State has achieved significant milestones, including a steady increase in domestic and international tourist arrivals, enhanced tourism infrastructure, and a growing reputation for sustainable and responsible tourism. Initiatives such as year-round tourism development, digital innovation, and eco-friendly practices have positioned Kerala as a model destination in India.

The long-term vision for Kerala's tourism sector is to develop clean, attractive, and well-managed tourism hubs across the State that reflect its natural beauty and cultural richness. Each destination is envisioned as a unique experience, developed in accordance with Kerala's tourism master plan and in harmony with local heritage, aesthetics, and community values.

Looking ahead, Kerala is well positioned to capitalise on emerging opportunities in wellness tourism, workations, and immersive cultural experiences. Through accelerated policy implementation, strengthened stakeholder collaboration, and greater integration of technology, the State is progressing rapidly, ensuring that tourism continues to make a substantial contribution to economic growth, employment generation, and environmental sustainability.

Chapter 18

Kerala's Banking Architecture and Cooperative Sector: An Integrated Analysis

The State's financial sector is shaped by an interaction between commercial banks, well-developed cooperative institutions, and active local governments and community organisations. In the last decade, institutional diversity, decentralised governance, and broad-based participation have helped create a financial ecosystem that is accessible, resilient, and rooted in the State's social values. There has also been substantial advance in the growth of cooperatives in the productive and services sectors. This growth gains strength from strong primary agricultural credit societies, federated cooperatives, farmer producer companies, Kudumbashree units, and labour cooperatives. Policies and plans in the sector over the last decade have established a platform for the State to reap the benefits of collective action, and continue to focus on its commitment to the people.

The distinctive trajectory of the State with respect to financial institutions reflects a combination of structural, demographic, and socio-political factors: a literate population with deep engagement in formal finance, a long-standing remittance economy, early investments in cooperative institutions, and a vibrant culture of local self-government. Together, these elements have produced a financial infrastructure that is distinct from the experiences of many other Indian States.

The depth of Kerala's financial inclusion is often emphasised in national comparisons. The State consistently records high penetration of bank branches, deposits, and per capita credit; a strong presence of both public and private commercial banks; a historically influential cooperative banking structure; and a citizenry that readily adopts digital financial services. With nearly universal bank account ownership and a robust digital footprint, Kerala was declared the first fully digital banking State in India in January 2023. This milestone reflects both technological diffusion and institutional coordination across commercial banks, cooperative networks, State departments, and the Local-Self Governments (LSGs).

Although Kerala's financial architecture is today strongly anchored in commercial banking, its institutional origins in rural credit lie within the cooperative movement. Long before the post-nationalisation expansion of commercial banks into rural areas, cooperative societies and banks served as the main channel for agricultural lending and savings mobilisation. Their spatial reach, local governance, and member-driven structure enabled widespread access to institutional credit. Even though the share of cooperatives in ground-level credit (GLC) declined as commercial banks grew more rapidly after the mid-2000s, they remain deeply embedded in local economies and continue to command high levels of trust.

This chapter synthesises two major domains: the banking sector and the universe of cooperatives and agricultural collectives in Kerala. The first section focuses on the banking sector, examining long-term patterns in branch expansion, deposit mobilisation, credit flows, credit-deposit (CD) ratios, priority sector lending, and the adequacy of agricultural credit. The second section turns the focus to the cooperative and collective ecosystem- including Primary Agricultural Credit Societies (PACS), farmer collectives, women-led initiatives, labour cooperatives, Farmer Producer Companies (FPCs), and group farming movements. While the two domains are analytically distinct, they interact substantively in Kerala's rural economy, especially in the provision of credit, marketing infrastructure, and community-based support systems.

The Banking Sector in Kerala

Banking infrastructure and the evolution of the credit network

Kerala's banking network has undergone substantial transformation in the last two decades. The spatial distribution of branches, the composition of banking institutions, and the intensity of digital adoption together shape the contours of financial access in the State. Table 18.1 illustrates the expansion of commercial and cooperative branches from 2010 to 2025. The data reveal three distinctive patterns: the absolute growth in commercial bank branches; the stability, and not stagnation, of the cooperative branch network;and the increasing share of private sector banks in the overall system.

With roughly 2.6 per cent of the national population, the State has maintained around 4 per cent of the country's commercial bank branches over the last fifteen years. Equally striking is the spatial density of banking outlets: one commercial bank branch per 5.5

Table 18.1 *Trends in the number of bank branches in Kerala, 2010 to 2025*

As on March 31	Commercial banks					Cooperatives	
	Public SCBs	Private SCBs	RRBs	Total, Kerala	Total, India	Banks	PACS
2010	2,472	1,432	406	4,433(4.8)	88,960	674	1,608
2015	2,603	1,550	420	4,759(3.5)	1,30,047	768	1,605
2020	3,399	2,551	634	7,576(4.2)	1,57,163	841	1,609
2025	3,374	3,094	635	8,085(3.1)	1,73,540	845	1,636
CAGR 2010-15	1.04	1.6	0.7	1.4	7.9	2.7	-0.04
CAGR 2016-25	2.6	7.2	4.2	5.4	2.9	2.5	0.01

Source: SLBC, Kerala; RBI, 2025, Statistical Tables relating to Banks in India: 2023-24; Cooperative Statistics 2021-22 Department of Cooperation, GoK

Notes: (i) Figures in parenthesis refer to share in all India; (ii) Pvt SCBs include SFBs also (2020 and 2025); (iii) Cooperative bank branches are of KSCB, KSCARDB, PCARDBs and erstwhile DCBs

square kilometres in Kerala, compared to the national average of nearly 19 square kilometres. This spatial concentration is partly a function of Kerala's urban-rural continuum, reflecting a settlement pattern in which rural and semi-urban areas are densely populated and economically vibrant.

The high density of branches does not diminish the importance of digital banking; rather, the two operate in complementary ways. Even as mobile banking and online services expand, the volume of transactions passing through physical branches and ATMs remains substantial. Kerala's achievement as the first fully digital banking State is rooted in high digital adoption rates across demographic groups, but branch infrastructure continues to be essential for credit delivery, cash handling, and the provision of relationship-based services that digital modes cannot fully substitute.

Growth rates over time indicate a notable shift. From 2010 to 2015, branch expansion was slow, especially among public sector banks. However, between 2016 and 2025, all major categories—public sector, private sector, regional rural banks (RRBs), and cooperatives—recorded higher compound annual growth rates (CAGR). The particularly rapid expansion of private sector commercial banks (CAGR of over 7 per cent) coincides with national trends favouring private capital, aggressive retail credit growth, and diversification of loan portfolios beyond traditional corporate lending.

A distinctive feature of Kerala's banking geography is the dominance of semi-urban centres. Approximately two-thirds of all commercial bank branches are located in semi-urban areas. Cooperative banks, however, remain rural-anchored, with nearly half their branches operating in rural locations. This continues to position cooperatives as critical institutions for small-scale agriculture, household savings, self-employment, and informal-to-formal financial transitions.

Deposit mobilisation: Trends, composition, and the role of remittances

Deposit mobilisation in Kerala has historically been strong, reflecting a combination of high savings rates, the presence of a large number of financial institutions, and, importantly, the steady flow of remittances from the Gulf region and elsewhere. Table 18.2 summarises the trajectory of total deposits across banking institutions between 2010 and 2025.

Two clearly identifiable trends stand out. First, the total volume of deposits has grown at an accelerated pace since 2016. The average annual addition to deposits during 2016–2025 was nearly twice the corresponding figure for 2010–2015. Second, the composition of deposits has shifted markedly away from public sector commercial banks and toward private sector banks. Public sector banks, which held over 60 per cent of deposits in 2010, accounted for only about 45 per cent by 2025; private banks expanded their share correspondingly.

This redistribution reflects several structural factors: the consolidation of public sector banks (including the merger of State Bank of Travancore with State Bank of India), the aggressive retail and digital strategies of private banks, and the increasing preference among depositors for technologically sophisticated and personalised banking services. Private sector banks have capitalised on these preferences through targeted

Table 18.2 *Trends in total deposits in Kerala, 2010 to 2025* in Rs crore

As on March 31	Public SCBs	Private SCBs	RRBs	Cooperatives	Others	Total
2010	93,710	44,556	4,325	6,649	813	1,50,053(3.1)
2015	1,95,765	1,15,543	8,582	46,141	--	3,19,890(3.8)
2020	2,84,442	2,33,731	19,277	64,687	6,923	6,09,059(4.4)
2025	4,30,498	4,04,310	26,838	66,798	19,805	9,48,249(4.04)
2010 -15*	20,411	14,197	851	7,898		33,967
2016-25*	23,473	28,877	1,826	2,066		62,836

Source: SLBC, Kerala, Thiruvananthapuram; RBI, Handbook of Statistics on Indian Economy
Notes: (i) Figures in parenthesis refer to share in national figures; *Refer to average annual increase in deposit

products, faster service delivery, and branch expansion in high-income districts.

Remittances continue to be a decisive variable in Kerala's deposit growth. Historically, non-resident (NR) deposits have constituted an unusually large share of the State's deposit base. While the share fluctuated—over 40 per cent in the 2000s, dipping to around 28 per cent between 2010 and 2015—it rose again to nearly 36 per cent between 2016 and 2025. The almost perfect correlation between deposit inflows and remittance cycles underscores the macroeconomic sensitivity of Kerala's banking system. Periods of global oil price volatility, labour market restructuring in Gulf countries, or currency fluctuations typically manifest as fluctuations in NR deposit mobilisation.

Spatially, deposit mobilisation is concentrated in semi-urban and urban branches, mirroring household location patterns and economic activities. Rural branches contribute less than 5 per cent of total deposits. This low share does not necessarily imply financial exclusion; rather, it reflects the coexistence of rural financial access with savings instruments such as postal deposits, chit funds, micro-cooperative savings schemes, and informal networks. However, the declining rural deposit share indicates a need to revisit the role of rural branches in savings mobilisation, especially in the context of Government-led financial inclusion initiatives.

The evolution of loans and advances: Sectoral shifts and institutional dynamics

The expansion of loans and advances in Kerala's banking system reflects broader transformations in the State's economy as well as the changing strategies of banking institutions. Table 18.3 provides a detailed breakdown of loan outstanding across public sector banks (PSBs), private sector banks, RRBs, cooperative institutions, and other banks from 2010 to 2025. The data reveal a consistent increase in total advances, with a sharp acceleration after 2016.

Between 2010 and 2015, the average annual increase in advances was approximately Rs 30,000 crore; this rose to over Rs 43,000 crore during 2016–2025. This acceleration coincides with several macro- and micro-level developments:

- Growth in retail credit, particularly housing, vehicle loans, personal loans, and educational loans.
- Expansion of private sector banks, which aggressively targeted consumption-led credit markets.
- Structural transitions in Kerala's economy, with increasing employment in the service sector and a shift towards self-employment and small enterprises.
- Government-led credit expansion programmes, including targeted agricultural credit campaigns and MSME credit schemes.

The institutional composition of credit outstanding reveals an important structural shift. Public sector banks—traditionally the dominant lenders—saw their share decline from more than 63 per cent of total advances in 2010 to around 49 per cent by 2025. Private sector banks increased their share by more than 10 percentage points over the same period, driven largely by branch expansion, technology-led customer acquisition, and customised retail credit products.

Regional Rural Banks (RRBs), represented by Kerala Gramin Bank (KGB), maintained a relatively stable share (around 4 per cent), despite being highly active in rural lending. Their limited share reflects the structural constraint of smaller scale and restricted branch networks relative to SCBs. Cooperative institutions, though historically important for agricultural and rural

Table 18.3 *Trend in total bank advances in Kerala, 2010 to 2025* in Rs crore

As on March 31	Public SCBs	Private SCBs	RRBs	Cooperatives	Others	Total
2010	63,798	27,885	4,764	4,023	540	1,01,010 (3)
2015	1,37,909	70,330	10,467	33,514	--	2,52,220 (4.1)
2020	1,95,503	1,41,807	17,912	50,334	4,052	4,09,608 (4.4)
2025	3,35,394	2,58,092	27,563	55,265	7,199	6,83,513 (3.7)
2010-15*	14,822	8,489	1,141	5,898	--	30,242
2016-25*	19,749	18,776	1,710	2,175	--	43,129

Source: SLBC, Kerala, Thiruvananthapuram; http://rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=11790
Notes: Figures in parenthesis refer to share in all India figures; *refer to average annual increase in advances

credit, accounted for about 8 per cent of total advances by 2025- double their share in 2010. The growth in cooperative lending was modest in absolute terms compared with commercial banks, but the increase in their relative share indicates continued relevance, especially in rural districts.

The geographical pattern of loan outstanding mirrors Kerala's settlement density and economic composition. Semi-urban and urban branches account for nearly 95 per cent of loan outstanding. Rural branches hold less than 6 per cent of total loans but, interestingly, disburse a higher proportion of credit relative to the deposits they mobilise. This indicates that Kerala's rural banking centres function more as credit nodes than as savings hubs- an inversion of the pattern observed in many other States.

The substantial increase in loan outstanding, particularly in private sector banks, underscores Kerala's increasing integration with national credit markets. However, this also introduces vulnerabilities: overreliance on unsecured personal loans, rising household indebtedness, and exposure to downturns in consumption cycles.

The Credit–Deposit Ratio (CDR): Historical constraints and contemporary challenges

The credit–deposit ratio (CDR) is a critical indicator of the extent to which locally mobilised deposits are converted into credit within the State's economy. Kerala has historically exhibited a lower CDR compared with the national and southern regional averages. During the 1990s, Kerala's CDR averaged around 46 per cent- significantly below the all-India average of 55 per cent and the southern region's 73 per cent. This was a period marked by low agricultural credit, limited industrial activity, and the outflow of deposits to more credit-intensive States.

From the early 2000s onward, the CDR began to improve, reaching around 63 per cent on average between 2001 and 2015. The improvement was partly attributable to expansion in retail lending and the diversification of credit portfolios. However, the gap relative to regional and national levels persisted: southern States continued to average above 88 per cent, while the all-India average stood at nearly 69 per cent.

Post-2015, Kerala's CDR showed further improvement, hovering around 66–73 per cent between 2015 and 2025. By March 2025, the CDR stood at 72.1 per cent, reducing, but not eliminating, the gap with the national figure (79.1 per cent). The persistent shortfall indicates that a significant portion of deposits mobilised in Kerala continues to be deployed outside the State.

An institutional breakdown of the CDR shows contrasting patterns across banking categories:

- RRBs often record CDRs exceeding 100 per cent, reflecting their mandate to lend intensively in rural and semi-urban areas.
- Cooperative banks maintain CDRs consistently above the State average (above 80 per cent by 2025), reflecting their close linkage with local borrowers and limited geographical diversification.
- Public sector banks hover close to the State average but experience fluctuations related to merger-related transitions and shifts in lending policies.
- Private sector banks, despite aggressive expansion, maintain the lowest CDRs in the State. This is unsurprising: private banks tend to mobilise deposits in Kerala but lend significantly in other States to support high-yield corporate and retail portfolios.

From a policy perspective, the low CDR raises important questions regarding local capital retention, resource mobilisation, and the adequacy of long-term credit for productive sectors. Kerala's challenge lies not merely in increasing the CDR, but in doing so by enhancing productive investment rather than intensifying consumption loans.

Priority Sector Lending (PSL): Patterns, shifts, and emerging gaps

Priority sector lending plays a central role in shaping the distribution of credit across sectors deemed socially and economically significant. In Kerala, PSL performance has historically exceeded the mandated norms. While PSL outstanding in absolute terms has increased between 2010 and 2025, the share of PSL in total credit has declined from nearly 60 per cent in 2010 and 2015 to around 45.2 per cent by 2025. This decline reflects multiple dynamics:

- Rapid growth of non-priority retail lending, which expands faster than priority sector credit.
- A shift in commercial banks' portfolios, with increased focus on personal loans, credit cards, and housing loans.
- Limited diversification in Kerala's real sector, which constrains opportunities for productive priority lending.
- Over-reliance on renewable agricultural credit, particularly short-term crop loans backed by gold collateral.

The decreasing share of the "other priority sector" category (category apart from agriculture and MSME) —from 25 per cent in 2010 to about 8 per cent in 2025—reflects reduced lending to weaker sections, social infrastructure, and low-income housing, despite the continued need for such credit.

One area of concern is the persistently poor performance under the Differential Rate of Interest (DRI) scheme, a targeted programme intended to support the poorest and most vulnerable borrowers. Kerala's achievement averages only 0.017 per cent against the mandated 1 per cent of the previous year's credit. This is a systemic failure across banks and indicates deep-seated constraints in identifying, lending to, and supporting the poorest households through formal financial channels.

From a developmental perspective, the PSL data suggest that while the formal system is meeting broad targets, the distribution within the priority sector is becoming increasingly skewed: agricultural short-term loans remain high, but long-term investment credit, MSME loans, and weaker section lending require renewed policy attention

Ground-Level Credit (GLC): Agricultural lending and sectoral composition

Ground-level credit is a critical indicator of the credit delivered directly to productive sectors, especially agriculture, MSMEs, and services. The data on GLC flows to the primary, secondary, and tertiary sectors indicate a strong increase over the last decade, particularly in agriculture and MSMEs, but a substantial decline in tertiary sector disbursements.

Between 2015–16 and 2024–25, GLC increased by an average of Rs 15,800 crore annually – nearly double the annual increase during the previous period. This suggests improvements in credit planning, coordination between NABARD and SLBC, and better alignment with agricultural and MSME development programmes. However, the sectoral composition reveals the following:

- *Primary sector.* Its share increased from 47 per cent in 2009–10 to more than 65 per cent by 2024–25.
- *Secondary sector (MSMEs).* Its share rose sharply from 5 per cent to nearly 30 per cent, reflecting increased financing for small enterprises, especially in food processing, services, and rural crafts.
- *Tertiary sector.* Its share declined dramatically from 48 per cent to just 5 per cent, an alarming shift that raises questions about credit to services, trade, transport, and small commercial establishments.

The decline in tertiary lending is particularly concerning because the service sector accounts for more than 64 per cent of Kerala's Gross State Value Added (GSVA). The mismatch between sectoral economic composition and credit allocation indicates systemic gaps in assessment, risk evaluation, and credit product design.

Adequacy of agricultural credit: Intensity, allocation, and structural concerns

Agricultural credit in Kerala presents a paradox that distinguishes the State from most Indian regions. On one hand, Kerala exhibits exceptionally high levels of agricultural credit disbursement relative to the size of its agricultural sector. On the other hand, questions persist regarding the *utilisation* and *allocation* of this credit- specifically whether it translates into productive investment, capital formation, and sustained growth in agricultural output.

A key indicator is the ratio of agricultural GLC to agricultural Gross Value Added (GVA). According to the Internal Working Group (IWG) of the Reserve Bank of India (RBI), Kerala's ratio exceeds 180 per cent, far above the national average of 40–48 per cent. This implies that credit disbursed to agriculture is larger than the value generated by the sector itself. In some years—most notably 2020–21—total agricultural GLC even surpassed the current-price GVA of the agriculture and allied sectors. While this suggests a high degree of financial penetration, it raises concerns about possible diversion of agricultural loans to non-agricultural uses.

Several structural factors contribute to this phenomenon:

- *The dominance of gold-backed agricultural loans.* Kerala has one of the highest penetrations of gold-backed credit in India. Many short-term agricultural loans are collateralised using household gold, making them easily accessible and less dependent on actual cropping intensity. As a result, the categorisation of such loans as "agricultural credit" often bears limited relation to agricultural operations or investment.
- *Fragmented holdings and high lease cultivation.* Kerala's landholdings are severely fragmented, with a large share of agricultural activity based on leased or informally held land. This constrains opportunities for long-term capital formation, reducing demand for investment credit.
- *Declining agricultural workforce and crop diversity.* Kerala has experienced long-term declines in area under cultivation, especially in paddy and tuber crops. High-value commercial crops such as rubber, cardamom, and spices dominate, but these do not necessarily require proportional increases in long-term credit.
- *Overestimation of credit needs due to high-value inputs.* In commodity agriculture—particularly in plantation crops—price volatility, pest incidence, and climatic unpredictability result in fluctuating input requirements and working capital needs.

An alternative lens to assess adequacy—and possible excess—is the credit intensity per unit of land. Kerala's credit per hectare is among the highest in India: Rs 1.07 lakh per hectare in 2009–10 and nearly Rs 3.8 lakh per hectare by 2021–22. Even as the all-India average increased over the years, Kerala's figure stayed four to seven times higher. While this partly reflects high-value cropping systems and widespread use of technology and purchased inputs, such a gap is difficult to attribute to productive demand alone.

Collectively, these indicators highlight the need for rebalancing agricultural credit toward long-term investment, diversification of cropping systems, mechanisation, and value chain development- areas where credit remains limited relative to short-term lending.

Social security schemes and financial inclusion

Kerala's extensive banking network has facilitated strong integration with national social security and financial inclusion programmes. The performance under major schemes such as the Pradhan Mantri Jan-Dhan Yojana (PMJDY), Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), Pradhan Mantri Suraksha Bima Yojana (PMSBY), and Atal Pension Yojana (APY) underscores both the coverage and operational capacity of the State's financial institutions.

As of June 2025, Kerala had opened around 70 lakh PMJDY accounts, with a cumulative balance exceeding Rs 3,200 crore. This reflects more than 1.3 per cent of national PMJDY deposits—significant given Kerala's population share. Over 35 lakh RuPay cards have been issued, enabling digital access even for formerly unbanked groups.

Under the insurance-linked social security schemes, the State has exhibited high enrolment: 22 lakh beneficiaries under PMJJBY; 96.2 lakh beneficiaries under PMSBY; and 12.8 lakh subscribers under APY.

Wayanad and Palakkad Districts were declared fully saturated, meaning every eligible household had at least one member covered by PMJJBY or PMSBY. Kudumbashree networks, Panchayat-level outreach, and bank LSG coordination have significantly facilitated such saturation. Kerala's experience provides an important case study on how decentralised institutions can strengthen the operational effectiveness of national financial inclusion programmes.

Under the Pradhan Mantri Mudra Yojana (PMMY), Kerala has an outstanding loan portfolio of Rs 31,190 crore across nearly 39 lakh accounts (as of March 2025). While this reflects strong credit access for micro-enterprises, concerns persist aboutthe rising incidence of over-indebtedness, credit recycling through multiple loans, and limited graduation of micro-units into larger enterprises.

These outcomes reinforce the need for strengthening enterprise development ecosystems alongside credit delivery.

Cooperative Banking and Rural Credit Institutions

Kerala's cooperative sector occupies a unique position in the State's financial landscape. Cooperatives are more than financial institutions; they constitute

socio-economic platforms embedded in rural life, local governance, and collective action.

Historical evolution and institutional architecture

Kerala's cooperative movement has a long history, beginning with the Travancore Co-operative Societies Regulation Act of 1914 and the establishment of the Trivandrum Central Co-operative Bank in 1915. Over time, cooperatives became deeply woven into the fabric of rural development, particularly in the princely States of Travancore and Cochin, where they were early vehicles for rural credit and social mobilisation. Historically, Kerala operated a three-tier short-term credit structure, consisting of State Cooperative Bank (apex); District Cooperative Banks (DCBs); Primary Agricultural Credit Societies (PACS).

However, a major structural transformation took place in 2019 with the formation of Kerala Bank, created through the merger of the State Cooperative Bank and 13 DCBs. This consolidation sought to strengthen the financial health of cooperatives; harmonise software and accounting systems; create a unified balance sheet; and position the cooperative sector to compete more effectively with commercial banks.

Today, Kerala's short-term cooperative credit system comprises Kerala Bank and 1,636 PACS, supported by 3,481 branches. In the long-term structure, the Kerala State Cooperative Agriculture and Rural Development Bank (KSCARDB) and its affiliated Primary Cooperative ARDBs remain responsible for capital-intensive lending.

Kerala's cooperative network is not limited to credit. The Registrar of Cooperative Societies oversees diverse categories: consumer, marketing, women's cooperatives, housing, processing, tribal cooperatives, health cooperatives, and labour cooperatives. The number of societies increased from 15,287 in 2016 to 16,429 in 2024, but the share of functioning societies declined from 77.9 per cent to 74.8 per cent, reflecting growing challenges of dormancy, liquidation, or weak management.

This dual reality — expansion in numbers but weakened functioning — indicates the need for institutional strengthening, greater managerial oversight, and consolidation in over-saturated sub-sectors.

PACS: The foundation of rural cooperative banking

PACS constitute the backbone of Kerala's rural financial architecture. Their significance extends beyond credit delivery; they function as multi-purpose entities providing input supply, marketing, community services, and leadership development.

Membership patterns and coverage. The near-universal coverage of PACS in Kerala — present in every village — is a striking institutional achievement. Although the 1,607 PACS in Kerala account for only 1.5 per cent of India's total societies, they hold 17 per cent of total PACS members in India, and nearly 24 per cent of total borrowing members (as of 2022).

Total membership was about 2.7 crore in 2022, exceeding Kerala's estimated adult population. This unusual ratio reflects widespread membership among households with multiple adult members, widespread trust in cooperative institutions, and the multifunctional role PACS play in rural life.

Deposits, borrowings, and working capital. PACS in Kerala are major financial intermediaries in their own right. Their deposits — Rs 1.3 lakh crore in 2022 — constituted 69 per cent of all PACS deposits in India. This extraordinary share reflects high trust in cooperative institutions and their embeddedness in rural economies.

Borrowings from higher financial institutions remain low relative to deposits, indicating that PACS

Table 18.4 *Basic details of PACS in Kerala, 2010 to 2022*

As on March 31	PACS		Villages covered (%)	Members		Borrowers	
	Number	Share in all-India (%)		Number (lakh)	Share in all-India (%)	Number (lakh)	Share in all-India (%)
2010	1,608	1.7	99.2	192.2	10.1	82.5	32.2
2015	1,605	1.7	100	199.9	16.5	89.9	32.5
2018	1,609	1.7	100	243.5	22.9	100.4	35.8
2022	1,607	1.5	100	266.4	17.1	114.9	23.8

Source: GoK, 2021-22, Cooperative Statistics: 2021-22, Department of Cooperation, Thiruvananthapuram; NAFSCOB, Performance of PACS various issues, Navi Mumbai

Table 18.5 *Deposit, borrowing details of PACS in Kerala, 2010 to 2022* in Rs crore

As on March 31	PACS Deposits		Borrowings		Working capital	
	Amount	Share in all-India (%)	Amount	Share in all-India (%)	Amount	Share in all-India (%)
2010	25,151	59.3	2,798	5.4	34,232	19.2
2015	53,129	62.8	5,115	5.1	56,154	25.1
2018	91,774	69.5	7,558	5.4	1,11,402	32.6
2022	1,31,774	69	9,145	5.3	1,29,368	35

Source: GoK, 2021-22, Cooperative Statistics: 2021-22, Department of Cooperation, Thiruvananthapuram; NAFSCOB, Performance of PACS various issues, Navi Mumbai

rely heavily on member-based savings and internal resources.

Loan outstanding and disbursement patterns. Loan portfolios of PACS show increasing diversification. Total loans outstanding reached nearly Rs 1 lakh crore by 2022, with medium-term (MT) loans forming over 68 per cent of total outstanding. MT loan growth, with a CAGR of 14 per cent, has outpaced short-term (ST) loan growth (CAGR of 8.6 per cent).

However, agriculture-specific loans show a declining share- both in Kerala's PACS portfolio and in the national agricultural lending of PACS. Despite originally being primary institutions for farmers, PACS are lending proportionally less for agricultural operations and more for diversified activities, including small business loans, housing improvements, and non-farm rural enterprises.

Emerging issues and structural constraints in PACS. While Kerala's PACS system is often regarded as one of the most mature and expansive in India, it faces a number of evolving challenges that require serious academic and policy scrutiny. These issues relate to sectoral imbalances, portfolio quality, governance concerns, and the changing credit demands of rural populations.

Declining share of agriculture in PACS lending. One of the most striking trends in the cooperative credit structure is the gradual decline in the share of agricultural lending in the total loan portfolio. Although the absolute amount of agricultural lending has increased, its proportion relative to other categories has fallen sharply. This reflects a structural shift in rural financial demand: households increasingly seek credit for non-agricultural purposes such as housing improvements, small commercial ventures, education, or consumption expenditure.

Several factors contribute to this decline. Reduced area under cultivation, particularly in paddy-growing regions; diversification of rural occupations, with many households engaging in informal service-sector work, petty trade, transport, and tourism-related activities; constraints in agricultural profitability, especially in crops facing volatile prices (rubber, spices); and high levels of lease farming, which complicate access to formal agricultural credit due to lack of secure land tenure.

While diversification is not inherently negative, the declining weight of agriculture in PACS portfolios raises concerns about the weakening of PACS' core identity as institutions designed to serve farmers.

Table 18.6 *Loan outstanding of PACS in Kerala, 2010 to 2022* in Rs crore

As on March 31	ST loan		MT loan		Total	
	Amount	Share in all-India (%)	Amount	Share in all-India (%)	Amount	Share in all-India (%)
2010	11,187	21.5	9,666	49.2	20,853	29.3
2015	16,443	29.4	9,550	62.5	25,993	39.3
2018	21,419	21.3	32,321	61.4	53,740	35.1
2022	30,677	26.3	67,339	44.7	98,016	36.7

Source: GoK, 2021-22, Cooperative Statistics: 2021-22, Department of Cooperation, Thiruvananthapuram; NAFSCOB, Performance of PACS various issues, Navi Mumbai

Rising overdue levels and portfolio risk. The ratio of overdue loans to total outstanding increased from around 16.8 per cent in 2016 to 24.5 per cent in 2024, reflecting growing recovery challenges. Several post-Covid factors — income disruptions, reduced remittances in specific sub-periods, and fluctuating commodity prices — have contributed to this deterioration.

Overdues also reflect insufficient appraisal mechanisms at PACS-level, limited diversification of risks, factors affecting credit discipline, and weak enforcement capabilities compared with commercial banks. Unless overdue levels are contained, the financial viability of PACS may be compromised in the medium term.

Governance and managerial challenges. Although cooperatives are democratically governed, the quality of governance varies widely. PACS often face shortages of trained professional staff, non-standardised accounting systems (though this is improving after 2023 reforms), delays in audits, and varying levels of transparency in loan sanctioning. These issues underscore the need for stronger governance frameworks, enhanced training, and better integration with regulatory oversight mechanisms.

Falling proportion of borrowing members. Despite rising membership, the share of members actually availing loans declined from 96 per cent in 2016 to 57 per cent in 2024. This disconnect suggests that PACS are increasingly used as savings institutions rather than credit suppliers. While high savings mobilisation is positive, the declining credit outreach may weaken PACS' role as intermediaries supporting productive economic activities.

Cooperative reforms and governance transformation

Kerala's cooperative sector has undergone a series of reforms in recent years, culminating in the Kerala Cooperative Societies (Amendment) Act, 2023, which represents one of the most comprehensive legal overhauls in the State's cooperative history. Key features of the 2023 reforms include:

Enhanced transparency and accountability. These measures seek to reduce malpractices, improve the quality of financial reporting, and ensure credibility in cooperative operations and include mandatory adoption of common accounting software; computerised book keeping across PACS and other cooperatives; standardised audit procedures, including team audits; and accelerated arbitration processes, with judicial officers appointed as presiding officers.

Governance restructuring. These changes aim to reduce politicisation, improve generational renewal, and strengthen cooperative autonomy, and include: three-term limit for board members of credit societies; mandatory reservation for women and youth in managing committees; transparency in appointment procedures, with the Public Service Commission (PSC) regulating recruitment in apex federations and more stringent rules for societies; and provisions for removal and criminal action against board members involved in financial irregularities.

Strengthening deposit protection. Kerala is unique among Indian States in having a statutory Deposit Guarantee Fund Board. The cooperative deposit guarantee system covers deposits up to Rs 5 lakh per depositor and is financed by society contributions. This framework provides additional security to rural depositors and strengthens the reputation of cooperatives as safe savings institutions.

Revival and restructuring mechanisms. The Kerala Cooperative Revival Fund Scheme (2024) was introduced to rehabilitate weak or inactive societies. The scheme provides financial support, restructures liabilities, and enables mergers where necessary. This approach reflects an effort to consolidate the sector while maintaining community-based institutions.

Women, youth, and new cooperative models

Kerala's cooperative landscape has increasingly embraced inclusion and diversification. Two distinct shifts are notable: the expansion of women-centred cooperatives and the emergence of youth cooperatives.

Women's cooperatives and Vanithafed. The Kerala Women Cooperative Federation (Vanithafed) plays a pivotal role in supporting women-led economic initiatives. It provides credit and project-based support for member societies. Between 2016 and 2024, over Rs 11 crore in State assistance supported around 170 women's cooperatives. They complement the work of Kudumbashree by offering institutional platforms for enterprise expansion. These cooperatives are particularly active in micro-enterprise development, cottage industries, food processing, tailoring and garment production, and small retail outlets.

Youth cooperatives. Kerala has pro-actively established Youth Cooperative Societies to encourage entrepreneurship among the 18–45 age group. These

societies engage in diverse activities, such as agro-processing, digital services, eco-tourism, technology-enabled business models, and collective farming and marketing. By 2024, 32 societies had been registered, with financial assistance for 26 of them. These youth cooperatives are critical in revitalising the cooperative movement by attracting new generations who might otherwise gravitate toward the private sector.

Labour cooperatives and the ULCCS model. Kerala's labour cooperative movement, originating in the 1950s, remains a globally recognised example of worker-owned enterprise. The Uralungal Labour Contract Cooperative Society (ULCCS) exemplifies the potential of cooperatives as competitive, large-scale contractors. ULCCS is internationally recognised for corruption-free, high-quality public works execution, technical expertise, diversification into IT services (UL Cyberpark), professional management combined with worker ownership, and major infrastructure projects like the Valiyazheekkal Bridge.

The State's Labour Fed initiative seeks to replicate this model across other labour cooperatives through computerisation, modern construction technologies, a labour bank platform, welfare insurance schemes, and skill upgradation centres. The labour cooperative sector underscores the potential of cooperatives as not only financial institutions, but large-scale enterprises capable of competing with private contractors.

Cooperative-Led Agricultural and Rural Collectives in Kerala

Kerala's cooperative ecosystem extends far beyond banking. Over the last decades, the State has cultivated a rich landscape of collective action in agriculture-group farming initiatives, women-led agricultural collectives, Farmer Producer Organisations (FPOs), and cooperative-led processing enterprises. These collective structures play essential roles in revitalising agriculture, improving market access, enhancing bargaining power, pooling resources for mechanisation and input purchase, facilitating value addition, and aligning agriculture with new market opportunities.

Collective farming: Kerala's early experience

Collective farming has deep historical roots in Kerala. The first structured programme began in 1989–90 with group farming in rice, undertaken through *padasekharams* (polders). These group-based initiatives were motivated by two key objectives: reducing cultivation costs i.e., to reduce labour costs, address fragmentation, and facilitate bulk procurement of inputs; and increasing productivity. Studies by the Kerala State Planning Board (1995) showed substantial productivity gains — up to 686 kg/ha in some regions — reflecting benefits of synchronised land preparation, shared irrigation management, and joint pest control. Thus, *padasekharam*-based agriculture became a distinctive institutional feature in regions such as Kuttanad, Kole wetlands, and Palakkad.

The Kerala Horticulture Development Project (KHDP) and rise of SHGs

The 1993 KHDP initiative marked a major institutional innovation. With support from the European Economic Community, the project aimed to promote fruit and vegetable cultivation and introduce Self-Help Groups (SHGs) into horticulture. Its key contributions include integrating marketing, technical support, and credit, formation of Swashraya Karshaka Samithis (self-reliant farmer societies), reduced reliance on middle men, significant increases in horticultural productivity, and development of the Vegetable and Fruit Promotion Council Kerala (VFPCK).The KHDP experience provided the foundation for widespread SHG-based agriculture in Kerala, later reinforced through Kudumbashree.

Kudumbashree: Women-led agrarian change. Kudumbashree's collective farming initiative represents one of the most original contributions to rural development in Kerala. Formed in 1998, Kudumbashree is now one of the world's largest women-led poverty alleviation programmes, with over 48 lakh members. The key features of Kudumbashree's agricultural model include Joint Liability Groups (JLGs): nearly 99,259 JLGs cultivate around 24,153 hectares, making Kudumbashree the single largest institutional network of small-scale women cultivators in India; Lease-based land cultivation: women collectives lease fallow land, often facilitated through Panchayats, and undertake collective cultivation; Credit integration: Commercial banks provide subsidised loans under the JLG model, supported by certificates issued by Kudumbashree District Missions; and market-oriented production: Farm groups supply local markets, household consumption, and community-run outlets.

Kudumbashree's initiative has reversed the trend of declining agricultural participation by enabling women from marginalised households to enter agriculture as cultivators rather than agricultural labourers.

Technology-based cooperative interventions: The CITA model

The Cooperative Initiative in Technology-Driven Agriculture (CITA) is a flagship programme jointly led

by the State Planning Board and the Department of Cooperation. It aims to modernise Kerala's agriculture through cooperative institutions. Its key interventions include integrated farming support (crop + livestock + homestead production); grameen markets for local farm produce; storage and processing infrastructure for perishables; precision farming tools deployed through PACS and FPCs; and terrace and kitchen garden promotion through community cooperatives. Between 2022–23 and 2024–25, over Rs 13 crore was sanctioned for CITA projects, indicating substantial State commitment to cooperative-led technological upgrading.

Cooperative agribusiness models: The Sahya Foods example

Kerala has also produced several noteworthy cooperative-led agribusiness ventures that illustrate how rural collective institutions can transform production, processing, branding, and marketing. Among these, the Thankamani Service Cooperative Bank's initiative under the brand Sahya stands out as a compelling case of vertically integrated cooperative enterprise. The Thankamani Service Cooperative Bank, established in 1966 in Idukki district, has today diversified beyond traditional banking into full-scale agribusiness operations. Operating through five branches, the cooperative has built a portfolio of integrated economic activities aligned with local agricultural systems.

The Sahya agribusiness model, partially financed by the CITA scheme, comprises several units: a Tea Factory established at a cost of Rs 10 crore with Tea Board support and which processes up to 20,000 kg of fresh tea leaves daily, ensures minimum support prices for small growers, mitigating distress during price crashes, exports tea to international markets, and stabilises incomes for hundreds of growers; (a Dried Fruits Unit built under the Technology-Driven Agriculture (CITA) scheme, which dehydrates jackfruit, banana, tapioca, and meat using advanced dryers, and exports dried tapioca and *idiyirachi* (dried beef) to the Middle East; Coffee Powder Unit, established to promote processing and branding of local coffee and which supplies through route marketing networks and cooperative retail outlets; a Spice Marketing and Processing Unit, which purchases spices from farmers at remunerative prices and operates modern blending and packing facilities; and Sahya Farmers Producer Company, a NABARD-sponsored entity with 400 farmer-members and which runs spice-drying machines capable of processing 3,000 kg of cardamom daily and maintains its own land, buildings, and value-addition units.

Collectively, these units employ more than 250 individuals directly and many more indirectly, demonstrating the employment-generating capacity of cooperative agribusiness.

Sahya's products are marketed through Coopmart outlets, Government-owned Consumerfed and Supplyco, private distributors, online platforms and export channels. Renowned playback singer K. S. Chitra serves as the brand ambassador, enhancing its visibility. Sahya's case demonstrates the potential for PACS and cooperative banks in Kerala to evolve beyond credit provision into value chain creation. It embodies a shift from traditional cooperative functions towards integrated agribusiness ecosystems capable of competing with private firms.

Cooperative networks for skill development

Understanding that successful cooperatives require professional management, Kerala has invested in an institutional network for training that include the ACSTI (Agricultural Cooperative Staff Training Institute) that trains staff and directors of cooperative banks and PACS, the CAPE (Co-operative Academy of Professional Education) that operates engineering colleges, management institutes, skill development centres, and hospitals, and the NABARD-accredited ITM (Institute of Training and Management) that focuses on banking and finance training. This ecosystem ensures that cooperatives are supported not only by community trust but also by professional expertise.

FPCs: Institutionalising Aggregation and Market Power

Farmer Producer Companies (FPCs) represent a major strategic shift in India's agricultural policy framework. While cooperatives in Kerala have long organised farmers for credit, marketing, and service delivery, the formal FPC model marks a new institutional form aimed at linking farmers more directly to markets, technology, and value chains. In Kerala, FPCs coexist with and often emerge from cooperative structures, creating a hybrid ecosystem that blends cooperative values with corporate governance mechanisms.

Conceptual rationale for FPCs. FPCs were conceived as farmer-owned business entities aimed at aggregating production from small and marginal farmers (who make up nearly 97 per cent of Kerala's cultivators), reducing transaction costs, improving access to inputs and technology, negotiating better prices in output markets, building scale in procurement and marketing, and enhancing farmers' bargaining power in supply chains dominated by intermediaries.

Structure and membership norms. Kerala's FPC model typically involves Farmer Interest Groups (FIGs) of 10–20 members, federation of 12–50 FIGs to form a full FPC, a minimum of 100 founding members, eventually rising to 500–1000 members, and a professional management trained in marketing, accounting, and agri business. Separate FPCs are created for tribal communities, women farmers, export-oriented products, and value chain-specific commodities. This reflects Kerala's recognition of the importance of social inclusion and niche commodity specialisation.

Role of cooperatives and State institutions. Unlike several Indian States where FPCs function independently of cooperatives, Kerala has emphasised synergy. Key institutional linkages include Kerala Bank, which has supported the creation of 36 FPCs through budgetary grants; the NABARD, which sponsors and nurtures a majority of FPCs; the Department of Agriculture and the Planning Board, which provide technical support and policy alignment; and the PACS, which often serve as parent institutions for FPCs, leveraging their membership base. This hybridisation of PACS-led and standalone FPCs allows for flexible institutional forms that adapt to local conditions.

Evolving challenges. Despite rapid growth, Kerala's FPCs face challenges typical of collectivisation that include limited working capital; difficulties in meeting quality standards for export; inadequate storage and processing infrastructure; lack of managerial expertise in early years; competition from private aggregators; and the need for stronger brand identity. Yet, the experiences of Kerala's commodity-specific FPCs — particularly in spices, horticulture, banana, vegetables, and coconut — demonstrate significant potential for scaling inclusive agribusiness models.

Farmer collectives and local value chains

Kerala's agricultural production is inherently smallholder-based and diversified. Collective institutions — cooperatives, FPCs, PACS, women-led JLGs, and SHGs — play essential roles in building localised value chains.

Input supply chains. PACS and FPCs are key suppliers of high-quality seeds, organic manure, fertilisers and pesticides, micro-irrigation equipment, and mechanisation services (tractors, tillers, harvesters). Through shared services, they reduce costs for small holders and enable collective negotiation with suppliers.

Production and aggregation. Women JLGs under Kudumbashree and FPCs provide collective land preparation, synchronised sowing, shared irrigation, pooling of labour, and group-based harvesting. Aggregation reduces costs and enhances market quantities.

Processing and value addition. Processing is increasingly decentralised through mini rice mills, spice drying and grinding units, coconut value-addition units, turmeric and ginger processing clusters, and vegetable cleaning and packing centres. These facilities improve shelf life, reduce post-harvest losses, and increase farmer incomes.

Marketing and distribution. Collectives facilitate direct marketing through weekly and seasonal fairs, institutional supply chains (schools, hospitals, Kudumbashree cafés), procurement by Government agencies, cooperative-run retail stores, and linkages to e-commerce portals. By shortening the supply chain, these initiatives increase the share of consumer rupee reaching farmers.

Challenges Confronting Kerala's Cooperative Sector and Rural Collectives

The cooperative and collective ecosystem in Kerala stands out for its breadth, inclusiveness, and institutional depth. Yet, the landscape faces several evolving challenges that require careful policy analysis.

Structural challenges

Overcrowding and dormancy of societies. While the total number of societies under the Registrar of Cooperative Societies has increased from approximately 15,300 in 2016 to over 16,300 in 2024, the proportion of functional societies has declined. Nearly one in four societies is dormant or under liquidation. Excessive proliferation, overlapping functions, and politicisation at the time of registration have contributed to saturation. Overcrowding leads to duplication of functions and competition among cooperatives, dilution of accountability, and spreading of limited managerial capacity across too many institutions. A consolidation strategy similar to the Kerala Bank initiative may be required in select sectors.

Financial stress and high overdues. Overdue levels are rising across PACS and several other credit cooperatives. Post-pandemic shocks have intensified repayment stress due to reduced incomes among households, increased consumption loans, price volatility in plantation crops, and supply chain disruptions. High overdues not only affect liquidity but also risk eroding the confidence of depositors, especially in societies heavily dependent on member-based savings for working capital.

Heavy reliance on deposit mobilisation. Kerala's cooperatives have unusual financial structures in which deposits account for a very high share of total working capital (69 per cent of all PACS deposits in India are in Kerala). While this reflects trust, it also creates vulnerability; deposit withdrawal or a loss of trust can disrupt operations. Cooperatives need diversified resource mobilisation strategies beyond member deposits.

Governance and institutional capacity constraints

Political interference and board-level instability. External influence in cooperative management is a widely acknowledged challenge. While democratic functioning is essential, excessive involvement by political actors often leads to irregular credit sanctioning, appointment of unqualified personnel, delays in implementing reforms, and weakening of audit compliance. The 2023 amendment attempts to curb this through term limits, standardised audits, and enhanced administrative oversight.

Managerial skill gaps. Many PACS and cooperatives lack trained accountants, IT-enabled data systems, skilled managers for agribusiness and supply chain management, and knowledge of regulatory norms. Skill gaps hinder diversification into value-added activities and reduce resilience against financial risks.

Technological lag. Although Kerala's banking sector is highly digital, many cooperatives have yet to fully adopt cloud-based accounting, integrated MIS systems, automated risk assessment tools, and digital KYC and customer onboarding. The mandatory adoption of common accounting platforms is a positive step, but implementation remains uneven.

Sectoral challenges across cooperative types

Consumer cooperatives. Consumer cooperatives face stiff competition from private retail chains and e-commerce. Issues include high operating costs, outdated procurement processes, limited digital presence, and challenges in quality assurance.

Marketing cooperatives. Marketing cooperatives — especially in coconut, rubber, spices, and dairy — struggle with global price volatility, competition from private aggregators, and inadequately modernised processing facilities.

Women's cooperatives. Despite their vibrancy, women's cooperatives face limited access to working capital, high enterprise mortality rates, and insufficient marketing support. Many societies depend on government schemes, raising concerns about long-term sustainability.

Tribal cooperatives. Tribal cooperatives often operate in remote areas with limited access to markets, infrastructure, and skilled personnel. They require specialised institutional support tailored to socio-cultural contexts.

Challenges in collective agriculture and FPC ecosystems

Fragmentation of land and tenancy issues. Collective farming often relies on leased land, but informal tenancy arrangements complicate access to agricultural credit, implementation of mechanisation, and long-term infrastructure investment.

Limited working capital for FPCs. Most FPCs struggle to secure adequate bank credit, particularly in early years, due to weak balance sheets, lack of collateral, insufficient professional management, and risk-averse lending practices by banks.

Marketing constraints. Despite improvements, FPCs still encounter inconsistent quality standards, limited access to bulk buyers and export markets, and competition from private traders with established networks.

Need for professionalisation. FPCs must evolve from community organisations to professionally managed enterprises. This transition requires training in financial management, digital marketing, business strategy, and supply chain logistics.

New policy directions

Addressing the challenges identified above requires a set of coordinated strategies. Kerala has a unique institutional ecosystem, combining cooperatives, Panchayats, SHGs, and State agencies. Leveraging this ecosystem effectively can propel the next phase of cooperative-led development. A broad summary of a potential path ahead is provided in Figure 18.1.

Conclusions

Kerala's financial ecosystem — comprising its extensive commercial banking sector, vibrant cooperative institutions, and diverse agricultural collectives — illustrates a distinctive trajectory of inclusive economic development. The State has successfully blended institutional diversity, decentralised governance, and community participation to create a financial architecture that is simultaneously dense, accessible, and socially embedded.

The banking sector demonstrates strong deposit mobilisation, advanced digital adoption, and steady expansion of credit. Yet, persistent issues such as low CD ratios, skewed priority sector allocations, and

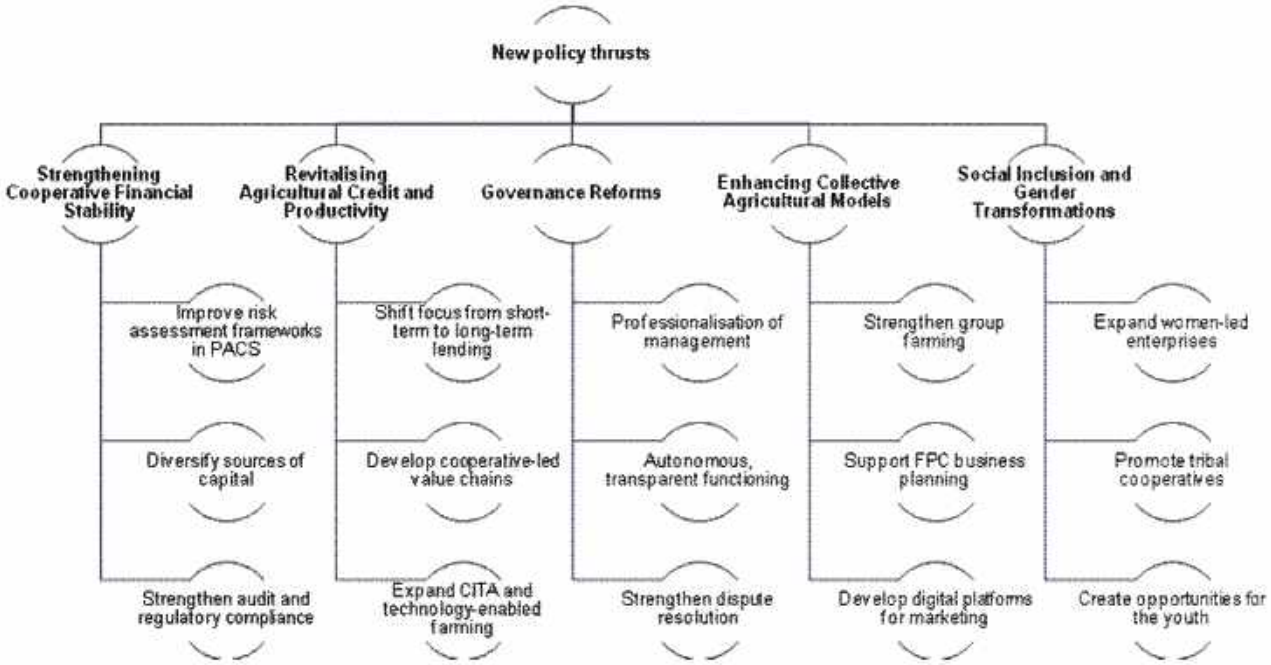


Figure 18.1 *A summary of future policy thrusts*

reliance on short-term agricultural credit highlight areas requiring policy correction.

The cooperative sector, for its part, remains foundational to Kerala's rural economy. PACS, cooperatives, FPCs, Kudumbashree collectives, and labour cooperatives collectively structure economic life beyond the limits of purely market-based systems. They offer organisational forms that enhance bargaining power, build local value chains, promote gender inclusion, and generate employment. However, rising overdues, governance challenges, dormancy of societies, and the need for professionalisation necessitate renewed institutional investment.

Going forward, Kerala must consolidate its cooperative strengths while addressing structural weaknesses. Reinforcing governance reforms, strengthening value chains, promoting technological integration, and enhancing capital formation in agriculture are essential steps in this direction. The synergy between commercial banks, cooperatives, LSGs, and community institutions remains central to Kerala's developmental future.

By integrating the financial, cooperative, and collective-action landscapes into a coherent analytical narrative, the Kerala's model, while imperfect, offers a unique foundation for inclusive and sustainable development. It underscores the critical role of institutions rooted in community participation and democratic control in shaping economic resilience and social equity.

Chapter 19
Local Governments

Two processes have characterised the progress of Local Self-Governments (LSGs) in Kerala in the period after 2016. One is the strengthening of their role as instruments of people's participation. The second is the promotion of LSGs as centres of local economic growth, with a continued emphasis on efficient service delivery and the enhancement of quality of life for all. This transformation has been driven by the implementation of targeted schemes, institutional reform, and sustained increase in the finances made available to LSGs.

Decentralised planning has received renewed impetus through procedural reforms that simplified and accelerated project formulation and approval processes, thereby enhancing the quality and timeliness of local planning. This was reinforced by a substantial expansion of financial devolution to Local Self-Governments, with the share of the State Plan devolved rising from 22.9 per cent in 2016–17 to 28.5 per cent in 2026–27. In parallel, the Local Self-Government Department was restructured to function as a more cohesive, outcome-oriented institution by integrating the departments of Panchayats, Urban Affairs, Rural Development, Town Planning, and Engineering, within a unified administrative framework.

Through decentralised planning and participatory governance, LSGs have contributed significantly to improvements in human development indicators, the strengthening of public infrastructure, and the expansion of livelihood opportunities, particularly among rural and marginalised communities. LSGs oversee a substantial proportion of public expenditure, especially in critical sectors such as health, education, agriculture, and poverty alleviation, ensuring that development initiatives remain closely aligned with local priorities. They also play a key role in the efficient and accountable implementation of State- and Centrally sponsored schemes. By institutionalising community participation in budgeting and decision-making processes, LSGs have enhanced transparency and responsiveness, firmly establishing themselves as pivotal actors in Kerala's pursuit of a sustainable and equitable economy.

This chapter outlines how LSGs have contributed to sustaining Kerala's social and economic progress. It examines initiatives focused on poverty eradication and livelihood enhancement, highlighting programmes and community-driven interventions, such as Kudumbashree, that have underpinned the State's achievements in human development. The chapter also explores trends, challenges, and innovations in urban development, with particular attention to how urban LSGs are addressing issues of infrastructure, inclusivity, sustainability, and resilience.

Decentralisation and Local Self-Governments in Kerala

Kerala's decentralisation process entered a transformative phase with the 13th Five-Year Plan, which initiated several significant and innovative policy shifts. These reforms were designed to strengthen local self-governance, improve planning efficiency, and enhance the developmental impact of Local Self-Governments (LSGs).

Policy Reform to Strengthen Decentralisation

Kerala has 1,200 LSGs, which include 941 Gram Panchayats, 152 Block Panchayats, 14 District Panchayats, 87 Municipalities, and 6 Municipal Corporations. The 13th Five-Year Plan proposed simplification of the processes for Plan formulation and implementation, enabling LSGs to prepare their Plans in March, with a full year for implementation. Other reforms included the introduction of new working groups on biodiversity management, climate change, environmental protection and disaster management to enable climate-resilient planning. Changes were also made to the sectoral ceiling (the mandatory maximum or minimum allocation in the three sectors of allocation-production, services, and infrastructure) with the aim of enhancing production. Other changes included introducing provisions to implement innovative projects, broadening the scope of subsidies, formation of Planning Committees at the LSG-level, preparation of District Plans and disaster management plans, and formation of District Resource Centres. Over the last five years, the scope and roles of LSGs have increased as never before.

Building on the improvements in the 13th Plan, the 14th Plan presented a broader vision for sustainable and inclusive development, emphasising local economic development, environmental sustainability, and social equity, with the aim of building a knowledge-based economy. The new Plan built on the State's strengths in social investment, using it as a springboard to further enhance the growth of productive forces. In this process, the focus was on fostering innovation and

applying science and technology to evolve Kerala into a knowledge society.

Enhanced devolution of funds

The devolution of untied funds in a formula-based, non-discretionary, and equitable manner, a unique feature of Kerala's decentralisation paradigm, reached new heights during the 13th and 14th Plans. Untied funds that are devolved LSGs in three streams — General Purpose Funds to meet expenditures on traditional functions and establishment expenses; Maintenance Funds for the maintenance of assets of LSGs, including those transferred as part of decentralisation; and Development Funds (Plan allocation) to meet the development expenditures — were enhanced as per the recommendations of the Sixth State Finance Commission.

While the General Purpose Fund, which was 3.5 per cent of the State's own-tax revenue in the 13th Plan was increased to 4 per cent, the Maintenance Grant was increased from 6 per cent to 6.5 per cent of the State's own-tax revenue. The Development Fund, which was 22.9 per cent of the State's Plan outlay in 2016-17, was increased to 28 per cent in 2025-26, and 28.5 per cent in 2026-27. Formula-based devolution has ensured that financial resources reach all parts of the State, with a greater share directed towards its less developed areas. The transfer of resources has ensured that adequate funds reach every area, thereby boosting local area development and improving the lives of people. The Sixth Finance Commission had recommended a steady annual increase of 0.5 per cent until the total devolution reaches 30 per cent. The devolution of the Development Fund as a percentage of the State Plan has been steadily increasing, in line with the recommendations of the State Finance Commission-even in years when the Plan outlay remained unchanged.

Enhanced devolution has significantly improved the functions of LSGs. General Purpose Funds, primarily intended to cover the expenses related to the traditional functions and establishment costs of the LSGs increased from Rs 1,233.1 crore in 2016-17 to Rs 2,577.3 crore in 2025-26. The Maintenance Funds designated for the upkeep and repair of assets belonging to the LSGs, including those of transferred institutions, steadily increased from Rs 1,937.4 crore to Rs 4,188.9 crore.

Higher allocations for the Scheduled Caste Sub-Plan and the Tribal Sub-Plan

Kerala continues to implement the Scheduled Castes Sub-Plan (SCP) and the Tribal Sub-Plan (TSP), which provide special protective measures to improve the socio-economic conditions of people from Scheduled Castes and Scheduled Tribes, ensuring social equity and enhancing their quality of life. Devolution under SCSP and TSP, therefore, assumes prime importance in development planning.

Table 19.1 *Plan outlay (Development Fund) to LSGs, 2016 to 2026* in Rs crore

Year	State Plan outlay	Allocation to LSGs					Percentage of State Plan outlay
		General sector		Scheduled Caste Sub Plan	Tribal Sub Plan	Total	
		Normal share	Central Finance Commission award				
2016-17	24,000	2,995	1,310.1	1,038.9	156	5500	22.9
2017-18	26,500	3,371.6	1,507.9	1,172.1	176	6,227.5	23.5
2018-19	29,150	3,777.6	1,739.6	1,289.3	193.6	7,000	24.01
2019-20	30,610	3,604.6	2,338.6	1,353.8	203	7,500	24.5
2020-21	27,610	3,534.6	1,964.2	1,221.2	183.1	7,158*	25.9
2021-22	27,610	3,363.85	2,412	1,221.2	183.1	7,280	26
2022-23	30,370	4,087.1	2,418	1,341.3	201.6	8,048	26.5
2023-24	30,370	4,009.2	2,496	1,341.3	201.6	8,258#	27
2024-25	30,370	4,171.9	2,637.3	1,341.3	201.6	8,352	27.5
2025-26	32,500	4,799.1	2,649.1	1,435.2	215.7	9,100	28

Source: Budget Documents, various years

Note: *Includes Rs 255 crore for the World Bank-aided project of Kerala Waste Management Project (KSWMP) in municipalities. #includes Rs 210 crore for KSWMP

Although the allocation of Plan funds to SCSP and TSP from the State Plan outlay is made according to the ratio of the population of SCs and STs, in Kerala, an allocation exceeding the proportion of SCs and STs in the total population is ensured. Out of the total SCSP/TSP Plan outlay, a certain percentage of funds are earmarked for LSGs to implement schemes under decentralised planning. Over the last nine years, the TSP outlay to LSGs has increased from Rs 156 crore in 2016-17 to Rs 201.6 crore in 2024-25, while the SCSP outlay has risen from Rs 1,038.9 crore to Rs 1,341.3 crore. This allocation is utilised for beneficiary-oriented schemes and infrastructure development schemes. This enhanced allocation demonstrates the State's commitment to addressing the issues of marginalised and vulnerable communities.

Major Accomplishments of Decentralised Planning

LSGs are deeply ingrained in the political structure of Kerala, making it unlikely that any future Government can overlook their significance in the State's development. In Kerala, decentralised planning through the LSGs has been crucial to development in multiple sectors. Decentralisation has been responsible for the remarkable improvement in service delivery, equitable resource distribution, creation and maintenance of productive assets, ensuring livelihood security and fostering local economic development. It is worth noting that no other State has been able to build a decentralised planning system as robust and efficient as that in Kerala, even three decades after the constitutional amendments in this regard. A brief account of the State Government's accomplishments in local governance under the decentralised system over the last decade is provided below.

Eradication of Extreme Poverty

On November 1, 2025, Kerala declared itself the first State in India to eradicate extreme poverty through a four-year project that focused on providing basic needs including food, shelter, a health care, and livelihood support to identified families. The Extreme Poverty Eradication Programme (EPEP) identified 64,006 families through household visits and created individual micro-plans to address their specific challenges, ensuring access to essentials and livelihood support.

Industry

LSGs have made significant contributions to promoting micro, small, and medium enterprises (MSMEs) in the State through multiple interventions. They have supported small-scale industries established by individuals and women's collectives through back-end subsidies, with particular emphasis on enabling marginalised sections to start enterprises. Traditional rural enterprises have also received assistance through interest subsidies for the purchase of inputs and equipment. Recognising that employment generation requires a supportive State-level entrepreneurial ecosystem, several initiatives have been launched to foster entrepreneurship development. LSGs are now empowered to provide financial assistance and advisory support to entrepreneurs, supported by provisions such as interest subsidies on loans, technology transfer and upgradation funds, innovation and incubation funds, crisis management funds, and seed support schemes.

Table 19.2 *Devolution of Maintenance Fund and General Purpose Fund to LSGs, 2016 to 2026* Rs in crore

Year	Maintenance Fund			General Purpose Fund
	Non-road	Road	Total	
2016-17	645.9	1,291.9	1,937.8	1,233.1
2017-18	655.0	1,528.4	2,183.4	1,364.7
2018-19	703.2	1,640.7	2,343.9	1,426.7
2019-20	822.3	1,918.8	2,741.1	1,626.1
2020-21	883.2	2,060.7	2,943.8	1,717.2
2021-22	1,218.6	1,949.8	3,168.4	1,949.8
2022-23	1,156.0	1,849.6	3,005.7	1,849.6
2023-24	1,402.7	2,244.3	3,647.0	2,244.3
2024-25	1,588.9	2,542.3	4,131.2	2,542.3
2025-26	1,610.8	2,577.3	4,188.2	2,577.3

Source: Budget documents: various years

To ease the process of enterprise creation, new institutional arrangements — including entrepreneurship and employment development councils, technical committees, and local help desks — have been established. LSGs are expected to evolve into single-window clearance and facilitation centres by integrating entrepreneurship development, skilling, self-employment, and employment generation at the local level. This marks a significant shift in local governance in Kerala, with LSGs entering new domains of economic development. In addition, efforts are underway to establish incubation and community facilitation centres, and several District Panchayats have initiated projects to develop industrial parks.

The Government of Kerala declared 2022–23 as the Year of Enterprises, with the objective of starting one lakh MSMEs in the State. The target was achieved within 245 days, with 1,39,839 new MSMEs established during the year, generating employment for 3,00,049 people. In 2023–24, another 1,03,596 enterprises were set up, creating 2,18,000 jobs. To support these efforts, 1,153 professionally qualified interns were recruited to assist LSGs — one in each Gram Panchayat and one for every 20 wards in Municipalities and Municipal Corporations. Coordinated by Industrial Extension Officers of District and Taluk Industries Centres, these interns support entrepreneurs in obtaining licences, subsidies, and loans, preparing bankable projects, and accessing appropriate technologies. Building on the successful systems established over the past two years, this initiative aims to further strengthen enterprise facilitation and introduce various attractive support measures to foster a thriving entrepreneurial ecosystem in the State. As of January 12, 2026, there were 3,82,011 MSMEs established in the State, generating employment for 8,14,627 individuals.

Aligned with the One Lakh Enterprises Scheme, the Departments of Industries and Local Self-Governments jointly launched the One Local Body One Product (OLOP) scheme. The initiative focuses on the structured production and marketing of locally identified products, enabling access to global markets and ensuring fair prices. It is expected to significantly enhance returns for farmers and entrepreneurs engaged in value addition.

Under the Year of Enterprise campaign, the Samrambhaka Sabha — a Panchayat-level collective of entrepreneurs — was established to promote grassroots entrepreneurship, innovation, and local industrial growth. The platform identifies suitable industries for each locality, supports local entrepreneurs, facilitates access to infrastructure and skilled labour, and addresses grievances. It also strengthens the entrepreneurial ecosystem through market linkages, skill development support, and help desk services. These initiatives are further reinforced by the new institutional mechanisms for local economic development at the LSG level.

Skilling

LSGs in Kerala played a vital role in promoting skill development through decentralised planning and community engagement. In collaboration with State missions such as Kudumbashree and Kerala Academy for Skills Excellence (KASE), national schemes such as Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), and Departments of Scheduled Caste and Scheduled Tribe Development, LSGs have implemented focused training programmes to empower local youth, women, and marginalised groups. These training initiatives focused on sectors such as IT, agriculture, traditional industries, and entrepreneurship, often leveraging local infrastructure and institutions to drive growth.

Urban and rural LSGs alike have facilitated digital literacy, vocational education, and micro-enterprise development, making Kerala a model for community-driven skilling in India.

These skilling initiatives have led to notable outcomes, as reflected in the India Skills Report 2025, which reported that Kerala's workforce achieved a strong employability rate of 72.2 per cent, ranking fourth nationally, with even higher employability among youth (87.5 per cent in the 22–25 age group). Kerala has also been adjudged as one of the top States favoured for employment across India. The State is especially preferred by female job aspirants, in a validation of its strong workplace inclusion initiatives and diverse professional environments. The State has consistently maintained a rank in the top five, indicating that the LSGs' skilling programmes are effective.

LSGs have also taken the lead in organising Thozhil Sabhas, or job conclaves, as part of Kerala's effort to support youth employment and entrepreneurship. These local platforms help plan jobs at the local-level, identifying job seekers in each ward and informing them of opportunities available through different employment, entrepreneurship, and Government schemes. Participants are also offered training under the Knowledge Economy Mission through K-DISC.

In addition, initiatives such as Kudumbashree's new entrepreneurship programme, She-Starts, are promoted through Thozhil Sabhas to encourage women to take up entrepreneurial activities in partnership with LSGs.

The Vijnana Keralam programme, aimed to transform Kerala into a knowledge-based economy by enhancing the skills of the youth and creating large-scale employment opportunities, is also implemented with the help of LSGs. This programme, implemented under the Kerala Knowledge Economy Mission (KKEM) and coordinated by the Kerala Development and Innovation Strategic Council (K-DISC), focuses on providing internships, job-oriented training, and skill development to students and job seekers across the State. Vijnana Keralam connects educational institutions with industries, ensuring smoother transitions from education to employment through digital learning opportunities, job fairs, and financial incentives, such as stipends. The initiative aims to create over five lakh knowledge jobs in one year and empower Kerala's workforce for the future.

Sanitation and waste management

The Government of Kerala has prioritised waste management as a key development goal over the past decade, implementing strategic measures at both the State and local levels. LSGs serve as the primary implementing agencies responsible for waste management efforts, utilising both Centrally Sponsored Schemes (CSS) and programmes funded by the State. The Suchitwa Mission, acting as the technical body, plays a vital role in policy development, capacity enhancement and providing technical support for solid and liquid waste management throughout Kerala. (See Chapter 20, Environment and Growth, under the section Waste Management)

Public health

The decentralised system of health management led by the LSGs has played a significant role in strengthening health care delivery in the State. Efforts by LSGs to improve health facilities at the Village, Block, and District-levels, along with initiatives such as the Aardram Mission, have helped Kerala achieve significant progress in public health outcomes. During the Covid-19 pandemic, the State demonstrated exemplary crisis management, with the public health infrastructure and LSGs working in close coordination. This collaborative approach has earned Kerala both national and international acclaim. The State consistently ranks at the top in nearly all public health and healthcare infrastructure indicators in India.

As part of decentralisation, LSGs in Kerala were entrusted with critical responsibilities in managing public health at the community-level, particularly the administration of primary and secondary health institutions. Accordingly, LSGs have focused on addressing long-standing infrastructure gaps by constructing buildings for health institutions that had been neglected prior to decentralisation. However, LSG interventions in the healthcare sector were primarily limited to small-scale infrastructure development, medicine distribution, and epidemic prevention, with less attention to the quality of healthcare services. The 13th Five-Year Plan addressed this issue by prioritising the modernisation of infrastructure, and the provision of the best possible preventive, curative, and palliative care.

The situation has improved substantially due to a series of major interventions in this sector, particularly the Aardram Mission. The Mission aimed at the transformation of Kerala's public healthcare, with a focus on infrastructure and quality of care at every level. Funds from the LSGs have also been utilised to implement these changes. (See Chapter 5)

In the 14th Plan, the focus was on strengthening the healthcare system and bringing services closer to the community by establishing Public Health and Wellness Centres and upgrading existing facilities in institutions such as Primary Health Centres, Taluk hospitals, and District hospitals. A special focus has been placed on preventing non-communicable diseases by establishing screening clinics. Additionally, widespread medical camps have been organised across LSGs to contain the spread of communicable diseases.

LSGs have been integral to the implementation and coordination of nutrition-related interventions across the State, which includes strengthening the Supplementary Nutrition Programme, providing therapeutic diets for severely malnourished children, upgrading anganwadi infrastructure, offering parental and premarital counselling, developing Smart Anganwadi Centres, and establishing special centres for children with disabilities. The latest National Family Health Survey (NFHS-5) shows that in Kerala, indicators on the nutritional status of children are significantly better than national averages.

It is essential to recognise that LSGs in Kerala played a vital role not only in addressing direct health concerns but also in addressing the broader social determinants of health including environmental sanitation, access

to clean drinking water, nutrition, housing, and other related factors. They act as coordinating hubs, bringing together various departments, agencies, missions, and non-governmental organisations to implement health and welfare initiatives effectively.

Pain and palliative care

Kerala has been the pioneer in the country in community-level palliative care, and has been acknowledged by the World Health Organisation as a model for the rest of the country. The State policy on palliative care, declared in 2008, was revised in 2019. Palliative care was initiated in all LSGs, with the involvement of local health institutions, voluntary organisations, and individuals. Each LSG is required to have a primary home care unit for palliative care comprising the doctor at the health centre, health workers, palliative care nurse, ASHA worker, representatives of voluntary organisations engaged in providing home-based care, volunteers, NSS/NCC/SPC/Red Cross, and members of the local educational institutions. Moreover, the policy of 2019 has now been revised to incorporate and expand primary and secondary palliative care facilities.

In 2025, Kerala launched the Universal Palliative Care project and the Kerala Palliative Care Grid, a tech-enabled initiative that aims to unify palliative care efforts across the State and respond to the rising needs of an ageing population. The projects have been jointly rolled out by the Departments of Health and Local Self-Government. The new grid will generate real-time data on both patients and caregivers, enabling timely support and interventions. There were around 1,142 primary palliative care units operating under LSGs, along with over 500 home-care units run by voluntary organisations and more than 1,000 run by charitable and social-service groups. These units offered not only medical assistance but also psychological and financial support to patients and their families. The Palliative Care Grid is designed to systematically register patients, schedule home visits, track treatments and support caregivers Currently, over 1.5 lakh bed-bound patients,and 4 lakh people with serious health sufferings are registered on the platform. There are over 2,000 home care units and 1,00, 000 volunteers registered on the platform**.**

Public education

As in other parts of India, there was a increase in the number of students enrolled in the private sector in Kerala during the late eighties and nineties. The succeeding decade also recorded a shift towards enrolment in private schools. This was also a period of a fall in the rate of growth of the school-going population. As a result, there was a decline in enrolment, which threatened the existence of many public and aided schools.

In response to this situation, the Government made a conscious effort to revitalise public education through phased upgradation. As part of the Nava Kerala Mission, an overall quality-based school education developmental programme called the Public Education Protection Mission (Pothuvidyabhyasa Samrakshana Yajnam) was launched. Its focus has been on raising the quality of school education in the public sector. The most telling proof of the success of this bold intervention was the extraordinary surge in enrolment in Government schools over the last few years. This has reversed the previous trend of large-scale migration of students to the private sector that continues in other States. The Directorate of General Education's report on additional enrolment in Standards I-X between 2016-17 and 2021-22 shows that more than 8 lakh additional pupils have joined Government and aided schools in Kerala between 2017-18 and 2021-22. This impressive transformation has been made possible by the proactive roles played by the State Government, LSGs, elected representatives, civil society organisations and the general public as a whole.

The provisions of decentralised planning have given LSGs the freedom and authority to invest in the infrastructure development of schools. LSGs have invested in school buildings, toilets, drinking water, furniture, teaching aids and sports facilities. More recently, the huge investment to build State-of-the-art infrastructure for schools has been realised through the Kerala Infrastructure Investment Fund Board (KIIFB). LSGs also contribute to the State share of centrally sponsored schemes in education, such as Sarva Siksha Abhiyan (SSA).

It has also been observed that LSGs have played a significant role in revitalising parent-teacher associations, school management committees, and other community initiatives to improve school education. Many LSGs have also instituted scholarships and awards to motivate students. The LSGs also addressed the issue of the digital divide among children and took proactive steps to ensure online education during the pandemic. Several LSGs have helped schools conduct innovative programmes, such as counselling and special coaching programmes for arts, sports, and other areas.

The provision of free textbooks for children from Classes 1 to 8, additional academic support for kids, barrier-free infrastructure in schools, programmes to address learning gaps in children, and specific programmes to address the needs of children with physical and intellectual disabilities are some of the activities being implemented by LSGs. Most LSGs, in their projects, have envisioned the holistic development of children, which encompasses their physical, mental, emotional, and social needs, realised through facilities for sports and self-improvement, nurturing extracurricular talents, offering vocational training, and promoting parental and community involvement. During the pandemic period, LSGs were eager to provide students from disadvantaged backgrounds with devices and opportunities for online learning. All these interventions have yielded positive results, with Kerala receiving international recognition for its advances in education, particularly in universalising and improving the quality of school education in the State.

The focus on improving the quality of school education has shown exceptional results, as seen in Kerala's scores in national rankings. (See Chapter 3).

Infrastructure development

Decentralised planning has enabled LSGs to invest significantly in rural and urban public infrastructure, particularly the construction of rural roads. It is estimated that LSGs have earmarked about 19 per cent of Plan funds to renovate or upgrade existing roads, or construct new roads. Town and country roads have also improved substantially because of high investments in renovation and upgrading. There is also a better distribution of minor roads across the State. The Local Self-Government Department (LSGD) has made an innovative attempt to digitise the data on rural roads to avoid duplication of work and facilitate better allocation of resources to the LSGs for maintenance.

Agriculture and allied sectors

It was expected that decentralised planning would help mobilise people and resources to strengthen production in the economy. One important responsibility of the LSGs is to manage common property resources, such as land and water, through both participatory and scientific means. The LSGs were also tasked with formulating projects to enhance the production and productivity of major crops, thereby improving food and livelihood security. Additionally, they were tasked with improving animal husbandry to increase the production of meat, eggs, and milk, and developing fisheries to bridge the demand gap for fish and enhance income. To ensure investment in the productive sector, LSGs were required to earmark more Plan assistance for this sector.

The organisational mechanism to support agriculture has expanded substantially over the years with the active involvement of LSGs. The implementation of the Kerala Conversion of Paddy and Wetland Act (2008) involves significant roles for LSGs in overseeing conversions, identifying land parcels upon claims, conducting field verification, and providing sanctions and exemptions. Many Gram, Block,and District Panchayats have taken measures to revive declining rice cultivation through the preparation of watershed plans, restoring unused tanks and ponds, deepening canals and strengthening river sides and related activities, supply of seeds and equipment to farmers, forming "labour banks" with training in modern agricultural practices as well as in the handling of modern machinery and equipment. Kudumbashree Joint Liability Groups (JLGs) had also undertaken rice cultivation and horticulture by leasing land from farmers who had withdrawn from agriculture, thus enabling labouring agricultural households to engage in cultivation profitably. The implementation of MGNREGS has further boosted rice cultivation.

Tourism

LSGs have played an important role in promoting tourism by complementing initiatives of the State Government in the sector. Tourism has been a significant contributor to local economic development and a major source of revenue for LSGs. LSGs have implemented projects to develop basic amenities in tourism destinations and facilitate investment by providing hassle-free sanctions, permissions, and licences. Many District Panchayats have initiated local tourism development projects in association with the Tourism Department. The 14th Five-Year Plan has placed a strong emphasis on tourism to revive the economy from the effects of the pandemic. In view of this, programmes like Destination Challenge, Responsible Tourism and Sustainable Tangible Responsible Experiential Ethnic Tourism Hubs (STREET) are being implemented by LSGs in collaboration with the Tourism Department. The STREET project aims to introduce tourism initiatives that align with the region's culture and geography. These include green streets, cultural streets, ethnic cuisine/ food streets, village life experience/experiential tourism streets, agri-tourism, water, and arts streets.

By encouraging civic administrations to locate and develop at least one travel destination within their boundaries, the Destination Challenge aims to explore locations with tourism potential that have remained

unnoticed or under utilised. Initiatives to promote responsible tourism help mitigate the environmental impact of tourist influxes and their associated activities. One of the components is to introduce travellers to rustic spots in Kerala, ensuring income for the residents of such locations. For this, the Department of Tourism will bear 60 per cent (subject to a maximum of Rs 50 lakh) of the total project cost, while the LSGs will have to contribute the remaining amount, either from their own funds or through sponsorships. Besides identifying at least one destination under each LSG, the initiative envisions linking tourism activities with various LSG projects, giving impetus to domestic tourism, which has gained popularity after the pandemic.

In 2023, Kanthalloor Village Panchayat in Idukki District bagged the Gold award from the Government of India for the best rural tourism projects. In 2024, Kerala's Responsible Tourism (RT) received awards on World Tourism Day for the best RT village and the best agri-tourism village, for initiatives at Kadalundi and Kumarakom, respectively.

Disaster management

Kerala's LSGs play a crucial role in disaster management, actively participating in risk assessment, planning, preparation, and response efforts. Initiatives include integrating disaster risk into master plans, building LSG capacity, and developing local-level disaster management plans. These efforts are part of a broader strategy to build community resilience and ensure sustainable development in the face of disasters. LSGs are required to include disaster management and mitigation projects in their annual plans, taking into account the level of susceptibility to natural disasters and the existing capacity to address them. This not only disseminates the importance of building resilience but also sensitises the community to plausible pathways to achieve it. Urban LSGs are incorporating disaster risk information into their master plans. This includes mapping weather patterns, specific disaster risks (such as flooding and landslides), and infrastructure status to guide development towards climate-adaptive solutions. The Rebuild Kerala Initiative supports the development of risk-informed master plans and disaster climate action tracking tools to enhance the capacity of LSGs in disaster prevention, response, and mitigation. To a considerable extent, Kerala has successfully created general awareness of the need to address climate-related issues.

Climate change

Kerala has emerged as a pioneer in LSG-led climate action in India, implementing a range of decentralised, community-driven initiatives to combat climate change. Through tools like the Local Action Plans for Climate Change (LAPCC) and the Disaster and Climate Action Tracking (DCAT) system, over 200 LSGs have been enabled to map climate risks and implement targeted mitigation strategies. In July 2025, Kerala launched the Climate-Resilient and Energy-Efficient Agriculture (CREEA) plan, which promotes low-carbon farming, AI-powered weather forecasting, solar-powered irrigation, and sustainable crop practices, supported by K-CRAIL labs across selected districts. Notably, Meenangadi in Wayanad has become India's first carbon-neutral Panchayat, with similar goals being pursued by Perumatty and Kunnamkulam through afforestation, renewable energy, and EV adoption. On the disaster preparedness front, Kerala has developed hyperlocal early warning systems and a climate data observatory to guide flood risk management and land-use planning. Eco-restoration projects, such as those near Peppara Dam in Thiruvananthapuram, aim to revive native biodiversity and community stewardship. Collectively, these initiatives position Kerala as a model for bottom-up climate resilience rooted in local governance. As part of biodiversity conservation activities, every Panchayat in Kerala has a Biodiversity Management Committee (BMC) with a chairperson (the LSG head) and a member secretary (the LSG secretary). These BMCs are responsible for documenting local biodiversity in a People's Biodiversity Register (PBR) and conserving biodiversity within their jurisdiction.

Welfare of women and children

Kerala has long stood out for its high human development indices, underpinned by a progressive focus on education, health, and gender equity. Women in the State enjoy better literacy rates, health outcomes and a favourable sex ratio compared to most other Indian States. Women were legally granted special reservations in positions of people's representatives, starting at 33 per cent in the initial phase and later increased to 50 per cent in 2010. This policy change has significantly boosted women's participation in local governance and leadership roles. However, challenges remain in boosting women's socio-economic status and increasing their participation in the workforce. To address this, the Women Component Plan (WCP) — a key feature of Kerala's decentralised governance — mandates that LSGs allocate at least 10 per cent of their total plan outlay (excluding CFC grants) toward women-specific development initiatives. To fully leverage this mandate, there is a need for enhanced capacity among LSGs to

design and implement impactful, gender-responsive projects. Institutional mechanisms, such as gender resource centres, gender desks, and Jagratha Samithis, have been established to mainstream gender in local planning.

Kerala has implemented several grassroots programmes to empower women and adolescent girls, complementing its broader gender policy framework. The She Pad initiative improved menstrual hygiene by supplying subsidised sanitary pads and installing vending machines and incinerators in schools across the State. Kerala's District Panchayats, Municipal Corporations and Municipalities, in collaboration with District Planning Committees (DPCs), have launched several women-centric development initiatives in recent years Notable among them are Vanitha Junction by the Thiruvananthapuram District Panchayat (2024) and the Darpanam programme by the Kasaragod District Panchayat (2022), which offer skill training for women who have dropped out of school. The Thiruvananthapuram District Panchayat established a one-day women's shelter and instituted vigilance committees.

Several Gram Panchayats stood out for gender-responsive initiatives. For example, Thanalur and Amballur Gram Panchayats implemented martial arts training for girls, gender desks in schools, sanitary pad distribution, and wellness programmes as early as the 2020–21 academic year. Noolpuzha Panchayat in Wayanad opened the Penma rest and hygiene centre for women at the local health centre, while Chembilode Panchayat promoted gender awareness through community events. These decentralised efforts, supported by DPCs and LSGs, reflect Kerala's commitment to women's health, safety, entrepreneurship, and social inclusion through well-structured, locally relevant programmes.

e-Governance initiatives

LSGs in Kerala have embraced e-Governance through a range of digital initiatives aimed at improving transparency, efficiency, and citizen-centric service delivery. FRIENDS centres provide a single-window system for the payment of utility bills and government fees, while Akshaya Centres played a vital role in digital inclusion by offering a wide range of e-services across the State. In addition, platforms such as Sanchaya support the digital payment of taxes and fees, while Sevana enables the online issuance of birth, death, and marriage certificates. Sulekha, the MIS for Plan formulation and monitoring, assists LSGs in preparing, implementing, and monitoring decentralised development plans. Soochika, a beneficiary management system, helps ensure accurate targeting of welfare schemes.

A major recent development is K-SMART (Kerala - Solutions for Managing Administrative Reformation and Transformation). K-SMART brings together key municipal services, including property tax, building permits, trade licenses, birth and death registration, and grievance redressal, onto a unified online portal and mobile app, making services more accessible and streamlined for urban residents. K-SMART has been deployed in all the LSGs in Kerala in 2025, making it far easier for citizens to avail of the services from rural and urban LSGs. K-SMART is evolving into a comprehensive e-governance system, featuring state-of-the-art capabilities that enable interactive and predictive governance

Local Self-Government Programmes for Livelihood Security and Poverty Alleviation

In 2025, the Chief Minister of the State of Kerala made the historic announcement of the end of extreme poverty in the State. Over the years, the State Government has initiated innovative programmes such as Kudumbashree, Ashraya, and, more recently, the Extreme Poverty Eradication Programme. These efforts, together with schemes such as the Ayyankali Urban Employment Guarantee Programme (AUEGS) and Centrally Sponsored Schemes (CSS) including Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), the National Urban Livelihoods Mission, and the National Rural Livelihood Mission, have collectively contributed to improving livelihoods in both rural and urban areas. The following section provides an overview of key programmes and their outcomes that exemplify Kerala's integrated approach to poverty reduction and livelihood expansion.

Poverty Reduction

In Kerala, poverty reduction has been a key component of economic policy since the formation of the first Ministry, which initiated major interventions such as land reforms, public distribution, universal education, and other welfare measures. LSGs have played a crucial role in advancing this objective by implementing a range of social welfare initiatives, in addition to centrally sponsored schemes. The establishment of Kudumbashree provided a major impetus to these efforts. Ashraya, an innovative programme of the Government of Kerala, was launched to specifically target families among the poorest of the poor, including the destitute and the

physically and mentally challenged, on the premise that these groups were inadequately covered by existing anti-poverty programmes and often lacked awareness or the capacity to claim eligible entitlements.

In 2017, Ashraya was restructured as Agathirahithakeralam (Destitute-Free Kerala, DFK), with modifications aimed at expanding the scope and coverage of the programme. Notably, fisherfolk communities were included alongside SC/ST communities in the identification of risk parameters. DFK operates under the Kudumbashree Mission, with the active involvement of LSGs and other development departments. Under the programme, Kudumbashree allocates funding for basic needs through the Challenge Fund, amounting to 40 per cent of the total project cost, subject to a maximum of Rs 40 lakh for general projects and Rs 50 lakh for ST projects, while the remaining funds are contributed by the respective LSGs. Support is extended to deprived families through plans tailored to the specific needs of each group or household. The programme also leverages technology, including a mobile application, for beneficiary identification and project preparation, leading to improved cost-effectiveness and timely implementation.

As a result of these sustained efforts, Kerala's absolute poverty ratio (Government of India, 2014) declined significantly from 59.9 per cent in 1973–74 to 25.4 per cent in 1993–94, and further to 11.3 per cent by 2011–12. In 2011–12, the rural poverty headcount ratio dropped to 7.3 per cent, while urban poverty stood at 15.3 per cent. Furthermore, Kerala has been recognised as the State with the lowest level of multidimensional poverty in India, according to NITI Aayog's inaugural Multidimensional Poverty Index (MPI) report released in 2021. It registered low counts on almost all the parameters of deprivation, including child and adolescent mortality (0.19 per cent), maternal health (1.73 per cent), years of schooling (1.78 per cent), school attendance (0.3 per cent), and sanitation (1.86 per cent). Very few households were found to be deprived of essential services, including nutrition, cooking fuel, sanitation, drinking water, electricity, housing, assets, and bank accounts. According to the National Multidimensional Poverty Index: A Progressive Review 2023, the proportion of multidimensionally poor in Kerala declined further from 0.71 per cent to 0.55 per cent between 2015–16 and 2019–21.

In 2021, Kerala initiated a unique drive to eradicate extreme poverty starting with a State-wide survey to identify extremely poor households based on four key deprivation categories- lack of food, income, health, and shelter. Through this exercise, 64,006 families were identified as extremely poor, of which 20 per cent belonged to Scheduled Caste, and 5 per cent to Scheduled Tribe categories. A micro-plan was developed for each family, with projects to address their deprivations, and these micro-plans were consolidated at LSG-level into an Extreme Poverty Sub-Plan. The micro-plan projects are scrutinised as per existing guidelines and approved by the District Planning Committee. The micro-plans have been implemented with funds pooled from sources including LSGs, different departments, and CSR. In addition, gap funds of Rs 50 crore, Rs 50 crore, and Rs 60 crore were allotted by the State Government to LSGs in 2023-24, 2024-25, and 2025-26, respectively, to meet additional expenditure for implementing the projects.

The Extreme Poverty Eradication Project (EPEP) has been widely acclaimed as one of the most innovative initiatives in the country aimed at eliminating extreme poverty. A wide-ranging convergence of departments — such as Health, Civil Supplies, Education, Women and Child Development, Kerala Social Security Mission (KSSM), Kudumbashree, Revenue, Cooperatives, Scheduled Castes and Scheduled Tribes Development, Fisheries, Water Authority, and Electricity — has brought their expertise and resources together to support the objectives of the programme. By 2023, approximately 47.9 per cent of those identified as extremely poor had been lifted out of extreme poverty. On November 1, 2025, the State has been declared extreme poverty-free.

Many of the households identified as extremely poor were found to lack basic identity and welfare-access documents such as Aadhaar cards, ration cards, voter IDs, MGNREGS job cards, bank accounts, and social security pension documents. Through the Avakasham Athivegam campaign, LSGs organised special drives and camps with multiple Government departments (such as Revenue and Health) to deliver these services. Other EPEP initiatives include Manassodithiri Mannu, (which translates roughly to land from the heart), a voluntary land-donation campaign under Kerala's LIFE Mission, and Ujjeevanam, a 100-day livelihood campaign launched by Kudumbashree.

Housing

One of the most significant achievements of decentralised planning is the improvement in housing. In the 13th Plan period, implementation of the LIFE

programme was a major feature of Government policy. The LIFE project, started in 2016, is a comprehensive housing initiative, and has facilitated the construction of 4,71,442 houses, including LIFE Tower units, across the State as of October 31, 2025. This includes houses for 1,25,360 Scheduled Caste beneficiaries and 45,976 Scheduled Tribe beneficiaries. Over 5 lakh houses were completed by February 2026.

Employment and Livelihood Initiatives

Employment generation is a key priority in development policy in the State, and several programmes addressing it are executed at LSG-level. Rapid urbanisation, the persistence of informal labour, and the vulnerabilities faced by marginalised communities have intensified the demand for structured employment schemes. While India has pioneered large-scale rural employment programmes, such as MGNREGS, the discourse on urban employment guarantees is only emerging. Kerala has prioritised livelihood development schemes such as the Ayyankali Urban Employment Guarantee Scheme that ensures urban wage employment. The Kudumbashree Mission has made exceptional interventions in employment, especially women's employment. Other livelihood initiatives include Centre-State collaborations including the Deendayal Antyodaya Yojana–National Urban Livelihoods Mission (DAY-NULM) and Deendayal Antyodaya Yojana–National Rural Livelihoods Mission (DAY-NRLM).

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

Kerala has utilised MGNREGS as an effective tool in the State's development strategies for poverty alleviation, social security, and rural empowerment. Between 2016 and 2025, Kerala generated between 6 crore and 10.5 crore person-days of employment annually, with notable surges in 2018–19 following the devastating floods, and in 2020–21 during the Covid-19 pandemic. The State has consistently recorded the highest women's participation in MGNREGS across the country, with women accounting for 89–90 per cent of the total person-days. Additionally, participation of workers from Scheduled Castes has remained steady at 17–18 per cent, while participation from Scheduled Tribes workers has improved, rising from 5.5 per cent in 2018 to approximately 7.5 per cent in 2023–24. This improvement is due to targeted initiatives such as the State-funded Tribal Plus Scheme. Kerala's financial performance has been equally impressive, achieving 95–100 per cent fund utilisation, reflecting the State's efficient implementation of the programme.

In the financial year 2024-25, MGNREGS generated 286.2 crore person-days nationally, with women contributing 58.1 per cent, and Scheduled Caste (SC) and Scheduled Tribe (ST) beneficiaries contributing 18.6 per cent and 18.1 per cent, respectively. A total of 5.8 crore households were employed, with an average of 50.2 days of work per household, and 40.7 lakh households completed 100 days of employment. Kerala generated nearly 9 crore person-days, with 89.1 per cent of the work benefiting women, the highest rate among all States, far exceeding the national average. Additionally, 17.5 per cent of the work benefited SC beneficiaries, and 7.5 per cent benefited ST beneficiaries, highlighting Kerala's commitment to utilising MGNREGS for rural economic development and livelihood security.

Despite a lower approved labour budget in both 2024-25 and 2025-26, the demand for MGNREGS jobs and worker participation has remained exceptionally high. The number of person-days generated during these years surpassed the approved targets, highlighting the sustained and substantial need for rural employment opportunities.

The wage rate under MGNREGS in Kerala has steadily increased, from Rs 271 per day in FY 2019-20 to Rs 369 per day in FY 2025-26, reflecting adjustments to keep pace with inflation. However, cutbacks in the labour budget and delays in fund releases by the Central Government have caused delays in wage payments, financial straining households that depend on the scheme for income.

The State-funded Tribal Plus Scheme, implemented since 2017–18, provides up to 200 days of wage employment to Scheduled Tribe households. By introducing advanced wage payment systems in tribal regions such as Attappady, Wayanad, and Aralam Farm, Kerala has addressed participation barriers, ensured timely wage disbursement, and strengthened trust and engagement among ST workers. Supported by strong coordination between the MGNREGS Mission and the Scheduled Tribe Development Department, the initiative has consistently generated over 12 lakh person-days annually, significantly enhancing ST participation and establishing Kerala as a national model for inclusive and equitable MGNREGS implementation.

Kerala has effectively utilised the MGNREGS programme for a wide range of developmental activities, integrating it with various State initiatives

to boost rural economies and improve infrastructure. Through convergence with programmes such as Subhiksha Keralam, the State has enhanced agricultural productivity by creating assets like cattle sheds, farm ponds, and poultry sheds. Meanwhile, Suchitwa Keralam (Rural) has utilised MGNREGS to provide sanitation facilities, such as compost and soak pits. Partnerships with the Forest Department and the Neeruravu project have supported afforestation and sustainable water management. Additionally, the scheme has facilitated the construction of anganwadis, support to Scheduled Tribe families under Kerala Tribal Plus, and post-disaster recovery in Meppadi, demonstrating its broad impact on rural livelihoods and infrastructure. These integrated efforts demonstrate Kerala's use of MGNREGS not only for demand-driven employment generation but also as a tool for long-term, sustainable development across various sectors. Together, these categories meet immediate employment demands and promote long-term rural development, fostering a more inclusive economy.

MGNREGS has been the cornerstone of rural development in Kerala, providing essential economic support to households through guaranteed wage employment for unskilled manual labour. By strengthening financial security, the programme has helped reduce distress migration and empowers women by promoting their active participation in the workforce, fostering financial independence and addressing gender imbalances in rural employment. Overall, the programme has played a critical role in reducing poverty, promoting inclusive growth, and supporting long-term sustainable development in Kerala's rural economy. However, delays in payments, cuts in funding, or reductions in the approved labour budget undermine the programme's ability to meet the high demand for employment, which is crucial for many rural households. The restructuring, renaming, and downgrading of MGNREGS dilutes the prospects of rights-based livelihood security to the people. This will have adverse impacts on the States.

Ayyankali Urban Employment Guarantee Scheme (AUEGS)

The Ayyankali Urban Employment Guarantee Scheme (AUEGS) was introduced by the then Left Democratic Front (LDF) Government in 2010 as a pioneering initiative in the country aimed at addressing unemployment in urban areas. The AUEGS serves as a flagship programme of the State Government, designed to enhance livelihood security in urban settings by ensuring households with willing adult members engaged in unskilled manual labour receive a minimum of 100 days of wage employment. This scheme aligns with the foundational principles of MGNREGS. The scheme's resources are primarily allocated toward the development of durable assets within urban LSGs. Conceived as a rights-based programme, the operational guidelines outline a comprehensive list of permissible works — primarily semi-skilled and unskilled activities — including natural resource management, the creation of personal assets for SC or ST beneficiaries and persons with disabilities, construction and upkeep of public assets, development of public spaces, and the production of raw material for construction.

Over the past decade and a half, the scheme has generated considerable employment for marginalised groups, particularly women.

Since the 2016-17, significant progress has been made in implementing the Ayyankali Urban Employment Guarantee Scheme, with expenditure increasing from Rs 15 crore in 2016–17 to Rs 74.1 crore in 2024–25. In 2020-21 amidst the Covid-19 pandemic, expenditure on AUEGS crossed Rs 1 lakh crore, indicating the State's emphasis on livelihood support.

Employment generation under AUEGS, measured by person-days and the number of households provided with employment, closely aligns with the financial trends. From 2016-17 to 2024-25, nearly two crore person days of employment have been created through AUEGS. Aligning with the housing schemes of PMAY (U)–LIFE revitalised the programme, resulting in a sharp increase in fund utilisation and person-days of work. The scheme has been most successful in creating employment through house construction and related works.

After over a decade of implementation, the Ayyankali Urban Employment Guarantee Scheme (AUEGS) is at a critical juncture. The integration of PMAY(U)–LIFE with AUEGS gave new momentum to the latter, as reflected in increased budgetary support and employment opportunities. However, there is a significant challenge of educated unemployment in urban areas. The nature of employment sought by educated job seekers differs substantially from the type of work available to unskilled labourers, a mismatch that AUEGS has yet to address effectively. A more inclusive urban employment guarantee programme, one that responds to the distinct needs and aspirations of both unskilled and educated unemployed populations is necessary. A timely revision of operational guidelines

and the formulation of measures to ensure the scheme's long-term sustainability are imperative.

Kudumbashree

Kudumbashree, Kerala's pioneering poverty eradication and women empowerment mission launched in 1998, has become a beacon of hope for millions of women, especially those from marginalised communities. Its impact goes beyond economic upliftment, fostering social mobility, financial autonomy and greater participation in decision-making. The Mission's inclusive approach extends support to diverse groups, including transgender individuals, persons with disabilities, and the elderly, providing them with opportunities to enhance their livelihoods and assert their rights. As one of India's largest women-led community networks, Kudumbashree continues to drive income generation, social development, and community participation. The following section explores its transformative strategies, achievements, and challenges in empowering women across Kerala.

Over the past decade, Kudumbashree has broadened its reach, introduced innovative livelihood and social initiatives and emerged as a vital force in Kerala's overall development. The budgeted outlay of the State for Kudumbashree has shown a steady increase over the years, from Rs 13,000 lakh in 2016-17 to Rs 27,000 lakh in 2025-26, indicating continued financial support for the programme. Kudumbashree also played a crucial role in crisis management, demonstrating an active presence during the Covid-19 pandemic, major floods, and the Meppadi landslide.

Organisational strengthening

The Kudumbashree community-based organisation network has expanded to an impressive scale, comprising of 1,070 Community Development Societies (CDS), 19,470 Area Development Societies (ADS), and 3,17,724 Neighbourhood Groups (NHGs) with a total membership of 48,08,837 women, reflecting the Mission's strong grassroots presence and transformative reach across Kerala. For the period 2016–17 to 2025–26 (up to October), a total of 96,023 new Neighbourhood Groups (NHGs) were established, adding 11.5 lakh new members to the Kudumbashree network. To promote the inclusive development of persons with disabilities and socially marginalised communities, the Relationship Kerala initiative was launched. Through this initiative, 50 transgender NHGs with 550 members, 3,352 PWD NHGs with 32,860 members, and 25,992 elderly NHGs with 2,83,615 members were formed, ensuring representation and empowerment across diverse social groups. To strengthen the socio-cultural, educational, and livelihood development of young women, 19,472 auxiliary groups were organised at the ward level for women aged 18-45, bringing 3 lakh members into the network. The project Theerasree was also implemented to address the developmental challenges faced by coastal communities. To further reinforce Kudumbashree's three-tier organisational structure, initiatives such as Kudumbashree School, Back to School, Kudumbashree Radio, Model CDS activities, upgrading 617 CDS to ISO standards, and Village Poverty Reduction Plans (VPRPs) were implemented.

Livelihood initiatives of Kudumbashree

Kudumbashree livelihood initiatives focus on empowering women through micro-enterprises, agricultural development, livestock rearing, and skill training. Over the years, Kudumbashree has created a wide array of opportunities from food processing units and self-help groups to tribal livelihood programmes and agriculture-based enterprises.

Microfinance project. Kudumbashree's microfinance initiatives have played a crucial role in enhancing women's economic independence and improving the standard of living of families. Through thrift, internal lending, and bank linkage, Kudumbashree empowers its members to create self-employment opportunities and attain financial security. Over the past decade, the Neighbourhood Groups have accumulated deposits amounting to Rs 9,870.8 crore in various banks across the State, secured internal loans worth Rs 29,278 crore, and availed linkage loans totalling Rs 46,754.8 crore, reflecting the programme's sustained impact on grassroots financial empowerment.

Additionally, loans of Rs 17,369 crore have been devolved to various CDS'. A total of Rs 636.2 crore has been disbursed as interest subsidy for all loans extended to NHGs through Kudumbashree, including those under the Resurgent Kerala Loan Scheme introduced during the floods and the Chief Minister's Helping Hand Loan Scheme implemented during the Covid-19 period.

The State Insurance Department and the Life Insurance Corporation of India are implementing the Kudumbashree Jeevan Deepam Oruma Insurance Scheme to provide life/accident insurance coverage to Kudumbashree NHGs. In 2025-26 financial year, 13.7 lakh members have been enrolled in the scheme. As part of efforts to provide financial support to NHGs since 2016, a total of Rs 75.1 crore has been allocated over the past ten years as a revolving fund to 50,286 NHGs,

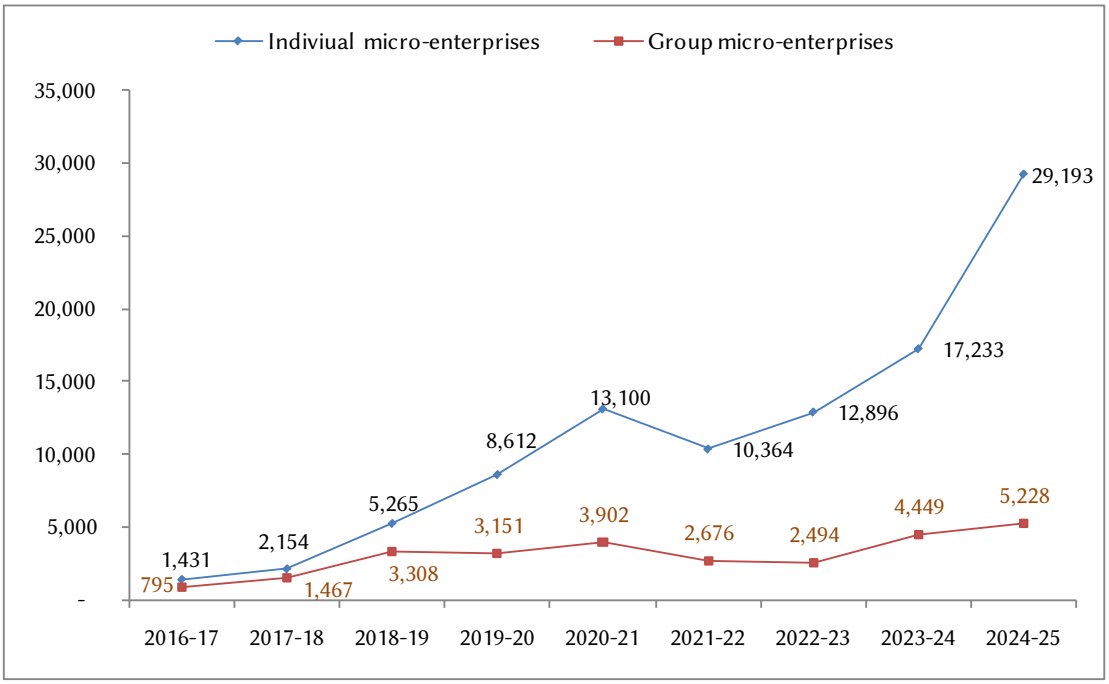
while Rs 48.4 crore has been provided to ADS' as a vulnerability reduction fund.

Micro enterprises. Kudumbashree's microenterprise ecosystem continues to expand and diversify its strong role in women-led livelihood development in Kerala. The Mission promoted Prathyasa Micro Enterprises, Coastal Micro Enterprises, café ventures, PMFME-supported units, and social sector initiatives,including Santhwanam and K4 Care. While some activities recorded limited new additions — such as Santhwanam volunteers and Amrutham Nutrimix units — others showed significant scaling Similarly, café-based enterprises, premium cafés, PMFME-supported enterprises, and e-Seva Kendras under convergence projects continued to strengthen the Mission's footprint across rural and urban areas.

As part of Kerala's comprehensive development efforts, the SVEP Umbrella Projects have played a pivotal role in strengthening grassroots entrepreneurship by fostering enterprise creation, capacity building, and enterprise growth across the State. Through the Start-up Village Entrepreneurship Programme, 45,369 enterprises have been established, supported by Rs 138 crore in Community Enterprise Fund assistance to 27,436 units, while the Rebuild Kerala Initiative has revitalised economic activity in 14 flood-affected Blocks by enabling the formation of 20,529 new enterprises. To accelerate enterprise scaling, the One Stop Facility Centre is working to upgrade 600 promising units across four Blocks. The Incubator Programme, implemented in collaboration with IIMK-Live, is nurturing 150 high-potential enterprises from 14 Districts into growth-oriented businesses. Complementing these initiatives, the Micro Enterprise Development Programme has supported the creation of 2,010 enterprises across 10 Districts, collectively contributing to Kerala's broader agenda of resilient, inclusive, and sustainable economic development.

As of November 1, 2025, a total of 1,78,864 micro enterprises are operational, including 15,868 new enterprises established in 2025–26, which engage 3,42,802 members. Of these, 1,24,909 are individual enterprises and 53,955 are group enterprises, spread across the production (78,324), service (54,339), and trade (46,741) sectors. The ecosystem also includes 2,104 Prathyasa enterprises, 2,368 coastal enterprises, six Common Facility Centres, 462 Santhwanam volunteers, 288 branded Café Kudumbashree outlets, and 14 premium cafés. Supporting initiatives include 31 Micro Enterprise Resource Centres (MERCs), 5,239 Inspire ME Insurance enterprises (benefiting 18,772 entrepreneurs), 241 Amrutham Nutrimix units, 3,109 PMFME enterprises, and 56.2 crore received under

Figure 19.1 *Micro Enterprises (MEs) established under Kudumbashree,2016-17 to 2024-25* in numbers



Source: Kudumbashree

Pravasi Bhadratha (PEARL) with 4,518 enterprises started.

Additionally, 723 Janakeeya Hotels operate with 2,982 members, while over 37,000 Haritha Karma Sena functions across the State. Convergence projects include 51 e-Sevakendras under the Motor Vehicles Department and 343 Kudumbashree-managed canteens in Government offices. The sector is further strengthened by 605 K4 Care Executives and five Incubation Hubs supporting new enterprise development.

Agriculture. Over the past decade, Kudumbashree has emerged as a transformative force in Kerala's agricultural sector and promoting food security. As of December 31, 2025, 99,259 farmers' groups are actively engaged in the special livelihood scheme aimed at achieving food security and self-sufficiency, with 4,52,912 women farmers cultivating 24,153 hectares of land across the State. Strengthening community-based agribusiness networks, 26,704 women are engaged in collection, processing, and marketing through 1,243 producer groups, while 19,944 Nattuchanthas were conducted with the active participation of 42,755 Joint Liability Groups, thereby enhancing local market access and ensuring fair prices. As of February 1, 2025 value-addition enterprises have expanded significantly, with 1,245 women entrepreneurs operating 256 medium-scale value-addition units, and 2,265 entrepreneurs managing 1,090 small-scale value-addition units, contributing to diversified agro-based income streams.

As of December 31, 2025, several new initiatives have shown notable progress. The Agri Nutri Garden Campaign has established 1,86,935 gardens, covering 5,369 acres and bringing 1,93,374 households into the programme, thereby promoting homestead food production and healthy dietary practices. Integrated farming has received a significant boost, with 37,500 women farmers gaining income and employment through 125 integrated farming clusters implemented across various Districts, strengthening climate-resilient livelihoods. Leveraging technology for agricultural advancement, the Kudumbashree Technology Advancement Programme (K-TAP) has created a centralised technology repository in collaboration with premier agricultural research institutions, enabling enterprises to adopt modern practices that enhance productivity and quality. Through these initiatives, Kudumbashree has strengthened Kerala's agricultural ecosystem and advanced inclusive, women-led, and sustainable development over the past decade.

Livestock initiatives. Kudumbashree has significantly strengthened the livestock livelihood sector in partnership with the Animal Husbandry Department. Substantial financial support was provided through the Ksheera Sagaram and Aadugramam schemes. As of November 1, 2025, Kudumbashree's livestock livelihood programme has achieved extensive State-wide coverage, reaching 14 Districts, 152 Blocks and 941 Panchayats, with 2,17,739 active livestock units benefiting 4,43,993 beneficiaries. The poultry sector supported 975 farmers through empanelled units, while 4,616 goat-rearing units and 3,909 cow-rearing units were actively assisted through subsidy schemes, covering 13,664 and 11,669 beneficiaries respectively. Community Enterprise Fund (CEF) support remains strong, with Rs 35.5 crore made available across 863 rural CDSs benefiting 18,909 members, and Rs 5.1 crore available in 112 urban CDSs benefiting 1,822 members. Additionally, 47 value-addition units are operating with 123 entrepreneurs, 598 livestock clusters have been formed with 30,083 members, and 4,321 Livestock CRPs are active at the field level. Overall, 550 producer groups involving 3,082 beneficiaries have been promoted, reflecting the depth and scale of Kudumbashree's livestock livelihood interventions across Kerala. As part of the Kudumbashree Livelihood Initiative for Transformation K-LIFT livelihood campaign. 1,00,825 Kudumbashree families secured income from livestock-based activities. Fisheries clusters were initiated in six Districts, and 492 farming clusters were developed to enhance collective operations and capacity building.

Kerala Chicken. The Kerala Chicken Programme has emerged as a flagship model of decentralised business in the State, conceived as a State-supported intervention to reduce dependency on poultry imports from neighbouring States and to provide access to safe, hygienic poultry meat. The programme promotes small-scale, locally managed poultry farms and dedicated retail outlets operated primarily through Kudumbashree women entrepreneurs. Comprehensive support, ranging from training and technical assistance to supply of chicks, feed, and assured buyback mechanisms, has enabled widespread adoption of this community-based enterprise model. As of November 1, 2025, the Kudumbashree Broiler Farmers Producer Company Limited has established a strong and expanding presence across Kerala, with 498 poultry farms and 152 branded retail outlets functioning in various districts. Farmers receive up to Rs 2.5 lakh every two months through poultry farming, and outlet beneficiaries get

an average monthly income of Rs 1 lakh. The initiative is particularly robust in Thiruvananthapuram, Kollam, Kottayam, Ernakulam, and Kozhikode, where higher farm and outlet density ensures consistent production, smooth distribution and better consumer access to safe, hygienic poultry meat.

Marketing initiatives. The marketing trajectory of Kudumbashree from 2016 to 2025 showcases a well-planned mix of policy support, decentralised execution, and brand-building. With continued emphasis on digital platforms, product standardisation, and urban market linkages, the programme is poised for further growth and national relevance in the coming years.

As of November 1, 2025, Kudumbashree's livelihood activities under the marketing sector showcase a vibrant and diverse set of platforms that enable women entrepreneurs to generate substantial income. Between 2016 and 2025, Kudumbashree transitioned from isolated local sales events to a layered strategy that integrates Onam Markets, Vishu Markets, a range of monthly markets, trade fairs, food fests, Nano Markets, kiosks, and the Kudumbashree Saras Mela. The programme has ensured consistent sales and visibility for micro-enterprise products. Kudumbashree, in collaboration with the Ministry of Rural Development, has organised 11 Saras Melas to date. The total turnover from all Saras Melas conducted since 2017 is Rs 97.4 crore. Additionally, initiatives such as Home Shops, marketing outlets, Pink Cafes, Kudumbashree Bazaar, and Pocket Mart online orders collectively strengthen livelihood security by expanding access to customers across rural and urban areas, reflecting Kudumbashree's continued commitment to enhancing women's economic empowerment through diversified marketing avenues.

Capacity building initiatives. Kudumbashree has played a pivotal role in empowering youth and women, particularly from disadvantaged backgrounds, through various skill development initiatives implemented under key government schemes. The Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) has trained over 86,000 individuals between 2016 and 2025, facilitating the employment of more than 56,000 beneficiaries. The programme has also provided targeted training for vulnerable groups such as Ashraya beneficiaries, Scheduled Caste individuals, orphans, and migrants. Under the Yuva Keralam Project**,** which was approved as part of the Rebuild Kerala Initiative with a budget of Rs 60 crore, over 6,300 educated young women have been trained, and 4,300 secured employment. The Sagarmala Project has focused on providing port-related skills training to 1,307 youth from coastal areas, resulting in 479 individuals securing jobs in the sector. Additionally, the Rural Self-Employment Training Institutes (RSETIs)**,** in partnership with banks and the Ministry of Rural Development, have successfully trained over 1,58,000 individuals in self-employment skills, with more than 1,10,000 securing employment opportunities in both self-employment and wage-based sectors. These initiatives offered vital opportunities for skill development, employment, and entrepreneurship to rural youth, women and marginalised communities across the State.

Social and community-based initiatives

Kudumbashree's social and community-based initiatives aim to empower women, children, and marginalised groups while strengthening community participation and social cohesion.

Social security. Kudumbashree is implementing a wide range of social security schemes to bring people that are marginalised, destitute, homeless and differently abled into the mainstream, with the flagship Agadhirahrita Keralam. This programme provides essential care and support to 1,57,382 destitute families in collaboration with LSGs, the Health Department, and voluntary organisations. In continuation of these efforts, Kudumbashree also plays a central role in the Extreme Poverty Eradication Programme. Kudumbashree teams conducted household visits to assess needs, identify members capable of livelihood activities, prepare customised project proposals and extend financial assistance through schemes like Pratyasha, Special Livelihood Projects, agricultural and animal husbandry initiatives, SVEP and the Community Enterprise Fund, resulting in 4,341 individuals securing stable livelihoods under the campaign Ujjeevan.

Buds institutions and Bala Sabha. Kudumbashree's Buds institutions played a vital role by providing holistic education, rehabilitation, vocational training, and emotional support to 13,081 children with disabilities through 378 centres established in collaboration with LSGs. Strengthening Kerala's social protection framework, the Government has approved 283 new institutions since 2017–18, supported by Rs 27 crore for development and Rs 5.5 crore for transportation, along with initiatives such as the Niramaya insurance, and specialised staff training. Key social inclusion programmes such as Thillana, Agri-Therapy, Buds Olympia, and livelihood initiatives under the brand Ithal, along with the observance of Buds Day on August

16, further enhances community participation and visibility for children with disabilities.

Kudumbashree's Bala Sabha platform promotes child development, social awareness, and skill development through various initiatives. According to the latest data, Kerala has a total of 31,612 Balasabhas, with 4,59,151 members, comprising 2,13,943 boys and 2,45,208 girls.

The Shuchityotsavam campaign educates children on waste management awareness, while Sajjam-Sukrutturaavam trains them in disaster preparedness and environmental resilience. District-level activities and the Children's Parliament nurture creativity, problem-solving, and leadership skills. Programmes like Mind Blowers and the Leora Fest enhance job skills and encourage innovation, with selected children receiving fellowships, reflecting a holistic approach to empowering children and fostering social responsibility.

Tribal development. Special interventions in tribal areas started during 2016-17. Over the past decade, Kudumbashree has made significant progress in enhancing the quality of life for Scheduled Tribes and integrating them into mainstream society. As of July 1, 2025, the programme has established 7,135 exclusive tribal NHGs with 1,24,904 members, including 3,321 self-reliant NHGs, alongside 742 group and 508 individual micro-enterprises and 4,094 tribal JLGs, supported by Corpus Fund assistance to 6,311 NHGs. Social and capacity-building initiatives include 2,015 Tribal Balasabhas (25,245 members), 112 adolescent clubs, 629 youth clubs, 378 Resource Persons trained in preparing hamlet development plans, and three tribal training groups. Education and livelihood support have been strengthened through 499 bridge courses benefiting 7,884 students, 356 traditional enterprises, and 1,613 livelihood-based animal husbandry units, reflecting a holistic approach to tribal empowerment and sustainable development.

Kudumbashree has also focused on promoting tribal entrepreneurship, arts, and education. Indigenous products such as Vanasundari Chicken, Mulayari Payasam, Van Dhan, Ganthe, Adi Kudaka, Coco, Coconut Oil, and Coffee have been branded and marketed, particularly in Ernakulam. Tribal children from Particularly Vulnerable Tribal Groups (PVTG) were trained in short film production, with their works showcased at the 2024–25 Kanas Jaga children's film festival, winning the Asia Talent Record. Initiatives like Janagalsa aim to preserve and promote local tribal art forms while enhancing the potential of micro-enterprises. The Communicore project provides English language skills to improve education, employment, and digital literacy. Furthermore, the Kudumbashree Tribal Enterprises and Innovation Centre (KTIC) fosters innovative livelihood opportunities for tribal youth, ensuring sustained socio-economic development.

Emergency response service. Kudumbashree has consistently demonstrated its pivotal role in disaster response and community resilience across Kerala. During the Covid-19 pandemic, the organisation ensured food security, local self-reliance, and community support. Utilising a three-tier WhatsApp network of 1.9 lakh groups with 22.5 lakh members, it conducted awareness campaigns, such as "Break the Chain," while NHG loan linkage programmes supported 45 lakh families. Volunteers assisted at LSG material packing centres and community kitchens, providing food to those under home quarantine and the most vulnerable members of the community. Kudumbashree units rapidly scaled production of 18.5 lakh cloth masks and 4,492.9 litres of sanitiser, while elderly residents were regularly monitored through Asraya and Snehitha Calling Bell initiatives, which also offered mental health support. Over 16,268 Joint Liability Groups contributed to community kitchens, supplying essential food items coordinated with District mission teams and Local Self-Governments.

During the 2018 Kerala floods, Kudumbashree's NHGs, JLGs, and volunteers actively participated in rescue and rehabilitation operations, coordinated community kitchens, distributed essential supplies, supported temporary shelters, conducted damage assessments and facilitated the restoration of livelihoods through micro-enterprise support and financial aid. Similarly, in the Meppadi landslide of 2022, Kudumbashree played a crucial role in relief and rehabilitation efforts in Wayanad, assisting with rescue operations, providing food and essential supplies, coordinating shelters, supporting damage assessments, offering psychosocial support, and restoring livelihoods. Across these crises, Kudumbashree has effectively mobilised community resources, collaborated closely with Government agencies, and leveraged its women-led networks, reflecting a strong model of social solidarity, resilience, and community empowerment.

Gender-related activities. Kudumbashree's gender empowerment initiatives have strengthened community support and awareness through multiple programmes which includes 40 Gender Resource Persons in the core team, 1,070 at the CDS level, 476 community

counsellors, and 19,370 members in Vigilant Groups. Additionally, 888 Gender Resource Centres, 15 Snehitha Gender Help Desks, 15 Rangasree units, 84 CDS-led crime mapping activities and 610 Gender Clubs have been established, reflecting a comprehensive approach to promoting gender equality and safety at the community level. The Food, Nutrition, Health, and WASH (FNHW) project, launched in Attappadi in 2015 and now expanded State-wide, focuses on improving food, nutrition, health, water, and sanitation for women and children. Through awareness initiatives including nutrition fairs, camps, and training, and the establishment of Happiness Centres under the Happy Kerala project, it aims to enhance community well-being across Kerala.

Deendayal Antyodaya Yojana – National Urban Livelihoods Mission (DAY-NULM)

DAY-NULM is a centrally sponsored scheme for urban livelihoods, with components addressing the formation and federation of thrift-and-credit groups, credit linkage, self-employment for individuals and groups, skilling, support for street vendors, and shelter for urban homeless. This scheme is implemented by the Kudumbasree Mission. Kerala has consistently been a top performer in achieving the scheme's targets and has consistently ranked among the top three States in the NULM Systematic Progressive Analytical Real Time Ranking (SPARK) awards since the inception of the awards.

Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)

Kudumbashree is a recognised National Resource Organisation (NRO) under the National Rural Livelihoods Mission (NRLM) since 2012, and serves as a national support agency for rural livelihood missions, with a particular focus on Panchayat governance and women's self-help groups. As Kerala's State Level Nodal Agency (SLNA) for the scheme, Kudumbashree implements programmes aimed at poverty alleviation, financial inclusion, livelihood promotion, skill development, and social empowerment. Key initiatives include Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) for skill training and employment, Start-up Village Entrepreneurship Programme(SVEP) for supporting rural enterprises, and Mahila Kisan Sashaktikaran Pariyojna (MKSP) for promoting gender-inclusive sustainable agriculture, collectively strengthening resilient, self-reliant rural communities.

Urban Development

Kerala presents a distinctive model of urban development in India, shaped by its unique settlement patterns (in particular, the rural-urban continuum), active local governments, and commitment to human development. The Government of Kerala is now focusing on issues of spatial planning and land-use, and the future of urbanisation, with special reference to the specific features of the configuration of Kerala's urban and rural areas.

During the 13th and 14th Five-Year Plan periods, the Government of Kerala maintained a clear approach to urbanisation and urban planning. The 13th Plan placed high priority on urbanisation issues, and on developing a comprehensive action plan for urban development. Building on this, the 14th Plan recognised that rapid urbanisation requires concerted efforts by LSGs to integrate central schemes and externally aided projects with regional plans, thereby enhancing infrastructure, civic amenities, and citizen services. Efforts were directed at modernising spatial planning techniques and methods. The Plan also acknowledged the importance of formulating master plans for urban development, considering Kerala's comparatively blurred boundaries between rural and urban areas, to ensure integrated development across regions.

A cursory look at the data reveals that over the past decade, Kerala has undergone significant shifts in urban governance, infrastructure, housing and service delivery. As the State strives for a more inclusive, sustainable, and climate-resilient urban future, it also faces ongoing challenges related to resource allocation and the addressing of infrastructure gaps in rapidly expanding secondary cities. This analysis examines the key trends, achievements, best practices, and strategic directions of Kerala's urban development over the past decade.

Urbanisation Trends in Kerala: Patterns and Pace

Kerala's population, as per the 2011 census, is 3.3 crore, with an average population density of 860 persons per square kilometre. Kerala's population density in 2021 was projected to be 913 persons per sq.km, more than double the national average (415 persons per sq.km). By 2036 the population is projected to be 3.7 crore, with a corresponding increase in the overall population density. According to the State Urbanisation Report (2011), Kerala's growing urban population is mainly due to the expansion of areas with an urban character, including the urbanisation of peripheral regions within existing urban centres. The percentage of the urban

population in the total population started to rise from the 1980s (18.8 per cent in 1981 to 26.4 per cent in 1991), exceeding the national average by 1991 (25.7 per cent). The percentage of the State's urban population increased rapidly from 26 per cent in 2001 to 47.7 per cent in 2011, higher than India's degree of urbanisation in 2011 (31.2 per cent). This rapid urbanisation mainly results from a shift in occupational patterns from agriculture. In 1981, the State had just nine urban agglomerations; by 2011, this number had increased to 19.

According to data from Fastest Growing Cities in the World, World Population Review, 2024, Malappuram District was the fastest-growing urban agglomeration globally during the 2015–2020 period with a growth rate of 44 per cent. Kozhikode, Kollam and Thrissur Districts ranked 4th, 10th, and 13th globally, with growth rates of 34.5 per cent, 31.1 per cent, and 30.2 per cent, respectively. Remarkably, Kerala had three of the world's 10 fastest-growing urban areas agglomerations in the period under consideration, and six of India's 10 fastest-growing urban agglomerations.

Official population projections anticipate continued and accelerated urbanisation in Kerala. It indicates that by 2036, Kerala's degree of urbanisation will be approximately 96 per cent.

As per Census 2011, the State's urban population of 1.6 crore was distributed across 59 statutory towns, 461 census towns, and 16 outgrowths, which are still part of Gram Panchayat areas. Together, the State's urban population is distributed across 536 "urban" areas.

The rapid urbanisation is also reflected in the substantial increase in the number of census towns between 2001 and 2011. In 2001, Kerala had 99 census towns and 60 statutory towns. By 2011, this number had surged to 461 census towns and 59 statutory towns, representing a 366 per cent increase in census towns. Wayanad and Idukki Districts had no census towns in 2011, and each had only one statutory town.

According to the 2011 Census, among the Districts, Ernakulam recorded the highest urban population share at 68.1 per cent, while Wayanad had the lowest at 3.8 per cent. Malappuram recorded the highest urban population growth, followed by Kollam, Thrissur, and Kasaragod. In Idukki and Wayanad, more than 95 per cent of the population is rural.

Kerala's evolving urbanisation trends reflect both the emerging needs and aspirations of its growing urban population, and the challenges of sustainable urban management. The pace and scale of urbanisation necessitated careful planning to address associated challenges such as infrastructure stress, environmental degradation, and social inequality. To harness the full potential of urbanisation while safeguarding its rich cultural and ecological heritage, Kerala established an Urban Policy Commission in 2023 — the first of its kind in India — to drive continued investments in infrastructure, environmental sustainability, and social inclusion. The Commission's recommendations will motivate and harness the positive contributions of cities and towns within the devolved LSG framework to meet global sustainability targets.

Spatial Planning for Urban Development in Kerala

Kerala presents a unique spatial settlement pattern often described as a "rural–urban continuum," in contrast to the more distinct rural–urban dichotomy found elsewhere in India. The State is characterised by elongated and densely interconnected settlements that blur the boundaries between rural and urban areas. This enables relatively equitable access to amenities and services, challenging conventional planning approaches that treat rural and urban as separate domains. Consequently, Kerala demands a spatial planning framework that is sensitive to its hybrid settlement structure and capable of addressing the complexities of such interconnected landscapes.

A significant turning point in spatial planning in Kerala is the enactment of the Kerala Town and Country Planning (KTCP) Act, 2016 (amended in 2021). The Act mandates the preparation of: Perspective plans preparation at the State, District and Metropolitan Areas; Master Plans for the Local Planning Area (the area of a Municipal Corporation, Municipal Council, Town Panchayat or Village Panchayat) and for the Joint Planning Area (as declared by the Government and which may span the area of more than one LSG); and Detailed Town Planning Schemes (where an LSG may undertake development of an area under its jurisdiction).

It established a unified legal foundation for participatory and decentralised planning. Recognising the dynamic nature of spatial planning, the Act was amended in 2021 to enhance its effectiveness. The following are the key spatial planning initiatives undertaken between 2016–17 and 2024–25:

State Spatial Perspective Plan (SPP). The KTCP mandates the preparation of a Spatial Perspective Plan to guide the State's long-term spatial development over 20 years. The formulation of the SPP began with preparatory activities, including data collation and

methodological design. In 2024, the State Town and Country Planning Committee (STCPC) was formally constituted, marking the transition to the active phase of plan preparation.

District Spatial Perspective Plans. The KTCP Act also mandates SPPs at the District-level to oversee decentralised spatial development. In 2023–24, Kerala launched the Spatial Perspective Plan for the Districts programme, with Wayanad's SPP currently underway. Prior to this, under the Integrated District Development Plan and Local Development Plan (IDDP and LDP) scheme, IDDPs were created for Kollam, Thrissur, Idukki, Palakkad, and Wayanad, with Kollam's being approved. Local development plans for areas such as Paravoor and Kodakara Gram Panchayats were also drafted under the scheme. To prepare for urban growth, District Urbanisation Reports and a State Urbanisation Report were completed before 2016–17. Currently, the District Urbanisation reports are being updated.

Master Plans for Urban Areas. The Act mandates the preparation of Master Plans for all statutory towns through the respective LSG. Between 2016 and 2025, the preparation of Master Plans of 85 out of 93 towns has been undertaken in three phases, under the relevant State Plan scheme. The centrally sponsored schemes AMRUT 1.0 and AMRUT 2.0 also support Master Plan preparation, including the use of high-resolution satellite imagery and UAV (unmanned aerial vehicle) technology. Master Plans for selected Gram Panchayats are being developed as a priority. Additionally, Local Area Plans with features such as Form-Based Codes and Value Capture Financing are being developed for five cities in the State.

While Kerala has made commendable strides in institutionalising spatial planning through statutory Master Plans and IDDPs, gaps remain in execution, technical capacity and project implementation. There is room for the integration of Master Plans with existing schemes, and of the need for an integrated platform for spatial data. Strengthening the role of urban LSGs, enhancing human resources, and integrating spatial plans with financial and sectoral strategies are essential.

Major Urban Development Initiatives

During the 13th and 14th Five-Year Plans, various urban development initiatives were carried out through State-sponsored, centrally-funded, and externally-aided programmes. Additionally, major urban infrastructure projects were financed by the Kerala Infrastructure Investment Fund Board (KIIFB) and the Rebuild Kerala Initiative (RKI). Moreover, the Union Finance Commission provides Special Purpose Grants to Urban Agglomerations with populations exceeding 10 lakh, including main cities and surrounding towns, to improve water supply, sanitation, and waste management. The 15th Finance Commission allocated Rs 1,402 crore from 2021-22 to 2025-26 for seven million-plus urban agglomerations/Cities. These grants are conditional, based on criteria set by the Union Government, and their disbursement depends on performance.

Major State-level interventions included the Ayyankali Urban Employment Guarantee Scheme (AUEGS), the LIFE Mission (Urban), Suchitwa Keralam (Urban), projects by the Thiruvananthapuram Development Authority (TRIDA) and Greater Cochin Development Authority (GCDA), and various initiatives by urban LSGs. It must be noted that the outlay for urban development programmes through Plan schemes is supplementary to the devolution of Development Funds from the State Plan to urban LSGs. These have been complemented by centrally sponsored schemes such as the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), the Swachh Bharat Mission (Urban), the National Urban Livelihood Mission (NULM), Smart Cities Mission, and the Pradhan Mantri Awas Yojana (PMAY) Urban. Furthermore, externally funded initiatives, such as the Kerala Solid Waste Management Project (KSWMP), have also played an important role. These programmes, along with the initiatives of LSGs and efforts of the private sector, have contributed significantly to the evolution of Kerala's urban landscape with improved infrastructure, service delivery, environmental sustainability, and inclusive urban livelihoods.

There has been a considerable increase in Annual Plan allocation and expenditure directed toward urban development during the 13th and 14th Five-Year Plan periods. Over these Plan periods, the total budgeted outlay amounted to Rs 19,011.5 crore. While expenditure in urban development over the entire 12th Plan period was Rs 940.6 crore, expenditure in the first year of the 13th Plan (2016-17) was Rs 874 crore. This increased consistently each year, up by nearly 49 per cent, to Rs 1,301.4 crore in 2024-25. These figures include both State and Central shares.

Infrastructure Development

In urban infrastructure, both State and Centrally Sponsored Schemes support the projects for the development of water supply, sewerage and septage management, multi-level parking, non-motorised

Table 19.3 *Expenditure on State and Central urban development Schemes, Kerala, 2016-17 to 2024-25*
in Rs crore

Year	Expenditure		
	State Schemes	Centrally Sponsored Schemes	Total
2016-17	376.4	497.5	873.9
2017-18	361.1	175.8	536.9
2018-19	595.1	449.3	1,044.4
2019-20	505.3	491.7	997
2020-21	902.4	648.3	1,550.7
2021-22	443	396.6	839.9
2022-23	726	765.9	1,491.9
2023-24	642.7	721.4	1,364.1
2024-25	787	513.1	1,301.4

Source: Budget documents, various years

transport, smart roads, city beautification, e-mobility and green city initiatives.

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT 1.0), launched by the Government of India in June 2015 and extended to December 2025, has been implemented in six Municipal Corporations and three Municipalities in Kerala (Alappuzha, Palakkad, and Guruvayoor) across five sectors: water supply, sewerage and septage management, storm water drainage, urban transport, and green spaces. The funding is shared in a 50:30:20 ratio among the Centre, State, and urban LSGs.

Under AMRUT 1.0, 1,108 projects costing Rs 2,357 crore were sanctioned, of which Rs 2,229 crore was expended, and 1,055 projects have been completed.

Through this Mission, significant strides have been made in improving water supply and sewerage management. Completed projects include 6 Water Treatment Plants with a total treatment capacity of 265 MLD and 5 WTPs with a total capacity of 165 MLD, 88,004 new household tap connections out of a target of 89,508, 2,036.9 km of water supply pipelines, 20 water storage tanks, including 19 Overhead Service Reservoirs and one Ground Level Service Reservoir, with a combined capacity of 365.5 lakh litres, 21 water kiosks. In the sewerage sector, completed projects include seven Sewage Treatment Plants (STPs) with a capacity of 28.2 MLD, two Mobile Septage Treatment Plants with a capacity of 20 KLD, 79.5 km of sewer networks, one Faecal Sludge Treatment Plant (FSTP) at Palakkad with a capacity of 100 KLD, 1,725 new sewer connections, and 1,19,325 households integrated into the septage management system.

The Mission has also made significant contributions to improving storm water management and enhancing green infrastructure. A total of 330.8 km of storm water drains have been laid, and 1,387 waterlogging points have been eliminated. Under the parks and green spaces component, 78 parks have been developed, totalling 55.2 acres. Urban mobility improvements include the construction of seven multi-level car parking facilities, 78 km of footpaths, 6.5 km of dedicated cycle tracks, 25 foot-over-bridges, and two walkways (a skywalk and a subway). Furthermore, the Mission has promoted energy efficiency by replacing two lakh streetlights with LEDs. Through the capacity building component, 2,493 functionaries have been trained, including officials from various departments and elected representatives of urban LSGs. Beyond physical progress, Kerala has demonstrated strong performance in urban governance reforms. The State has received reform incentives for the last four years consecutively, amounting to Rs 59.8 crore. With an average score of 82.5 per cent, Kerala ranks 7th in Urban Reform Implementation in the Ministry of Housing and Urban Affairs' (MoHUA) ranking.

AMRUT 2.0, an extension of AMRUT 1.0 launched on October 1, 2021, aims to address water scarcity, enhance water distribution in urban LSGs, and promote sustainable access to clean water. The programme is being implemented across all 93 urban LSGs in Kerala, with a five-year project timeline (2021–2026).

Under the AMRUT 2.0, a total of 737 projects have been initiated, of which 132 have been completed. The cumulative expenditure under AMRUT stands at

Rs 572 crore. The projects span four major sectors—water supply, sewerage and septage, water body rejuvenation, and parks. Notable achievements include laying 1,127.7 km of water supply network, providing 87,046 new tap connections, and rehabilitating nearly 1.2 lakh existing tap connections. In the sewerage and septage sector, 12.5 km of new sewer lines were laid, along with 39 new sewer connections, and 31 old connections were rehabilitated. Under the water body rejuvenation component, 98 out of 371 projects have been completed.

Under AMRUT 2.0, several progressive initiatives have been launched, and Kerala has received Rs 22 crore as reform incentives. The Thiruvananthapuram Municipal Corporation received Rs 10 crore for attaining over 85 per cent household tap connections, and Rs 12 crore for successful urban planning reforms. Under the Special Assistance for Capital Investment**,** Kerala received Rs 466.6 crore between 2022 and 2025 for town planning reforms. Under AMRUT 2.0, GIS-based master planning in 49 urban LSGs were initiated, eight technology startups were on boarded and operationalised through the AMRUT Mitra initiative, and trained SHG women were recruited for water-related services. Another innovative intervention was the deployment of Mobile Septage Treatment Units at Sabarimala.

Kerala's achievements in AMRUT have earned several national recognitions. These include awards such as the 2025 Silver National e-Governance Award for the Project Monitoring and Water Quality Monitoring Information System, the Platinum EEF Award for the Jalam Jeevan IEC campaign, and the Gold WET initiative at the ET Global Smart Cities Forum 2020. The Skywalk at Shakthan Nagar in Thrissur won the HUDCO Best Practices Award 2022–23,and a Special Mention at the 18th Urban Mobility India Conference 2025. Guruvayur Municipality received the Platinum State Pollution Control Board Award 2025 for environmental management, waterbody rejuvenation, and transforming waste dumps into green spaces, enabled by AMRUT interventions.

Another CSS in urban development and infrastructure is the Smart Cities Mission. Launched in 2015, the Mission aimed to encourage cities to provide essential infrastructure facilities and a decent quality of life for their citizens, foster a clean and sustainable environment and promote the use of smart solutions to improve urban governance standards. Kochi Municipal Corporation was selected in the first phase of the Mission, and Thiruvananthapuram Municipal Corporation in the third phase.

Cochin Smart Mission. For the Smart City project in Kochi, 98 individual projects (including five terminated projects) with an estimated cost of Rs 1,032 crore were identified. As of December 31, 2025 all projects have been completed, and closure procedures are in progress.

The completed projects include the Integrated Command Control and Communication Centre, smart roads in Ernakulam, implementation of Integrated Traffic Management System, construction of smart roads, installation of solar panels in Government buildings, distribution of household bins and street bins, redevelopment of Ernakulam Market, innovative solid waste systems, e-governance platforms, upgradation of Dutch Palace entry area, establishment of open-air theatre at Fort Kochi, beach front upgradation at Vasco square, e-health solution at General Hospital, Health ATM, police kiosks, and the open space corridor linking Durbar Hall ground to Mangalavanam.

Multi-level automated parking, canal rejuvenation, and LED lighting solutions are at advanced stages of implementation, marking significant strides toward transforming Kochi into a sustainable, technologically enabled urban centre.

Smart City, Thiruvananthapuram. Smart City, Thiruvananthapuram, has 79 sanctioned projects with a total cost of Rs 1,242.5 crore. Out of these, 65 projects, worth Rs 847.8 crore have been completed, and four projects of Rs 90.2 crore are in progress. There are 10 convergence projects worth Rs 304.4 crore, and these have been completed.

Major completed projects include the procurement of e-buses for KSRTC (Phases I and II), construction of multi-level car parks at Thampanoor and Palayam, rooftop solar installations (ANERT Phases I to VI), smart roads, sewer line realignment and brick manhole reconstruction, open-air theatre and park at Putharikkandam Maidanam, grid-connected roof-mounted solar PV power plants at five sites, traffic signal development, drinking water kiosks at 25 locations, the Charithra Veedhi urban street market including Sree Chitra Park, redevelopment of children's park, green activities linked to KWA, cultural streets like Manaveeyam Veedhi, upgrades to Rajaji public health centre, landscaping of Ponnara Sreedhar Park, improvement of temple tanks at Puthenchantha Sreekandeshwaram, public toilet renovations at six

sites, procurement of 15 e-autos, last-mile connectivity initiatives, construction of interactive kiosks with IT equipment procurement, phased upgrades of anganwadis, installation of outdoor gyms and children's play equipment at three sites, installation of statues at five locations, and procurement of smart EV chargers.

Development Authorities

The primary objective of development authorities is to facilitate sustainable and comprehensive development within their jurisdictions. In Kerala, these authorities, operating under the Kerala Town and Country Planning Act of 2016, play a crucial role in managing urban growth and infrastructure in a planned and organised manner. The Greater Cochin Development Authority (GCDA) currently oversees 75 initiatives with an estimated budget of Rs 568 crore, sourced from the State Plan and other funding avenues. Major projects include the renovation of the Jawaharlal Nehru International Stadium for the FIFA Under-17 World Cup, a housing complex for 82 families as part of the LIFE Mission Housing Project, and the She Hostel project.

Furthermore, a Food Street has been established in Kasthurba Nagar, and 11 parks in Kochi have been revitalised through Smart City funding. To address sanitation challenges, GCDA has constructed modern toilets at five sites and renovated the Kaloor Market.

The Trivandrum Development Authority (TRIDA) has initiated the Vattiyoorkavu Junction Project, funded via the State Plan with land acquisition facilitated by KIIFB resources. Land acquisition was completed in 2023-24, paving the way for upcoming construction. Additionally, administrative approval has been granted for the development of an Urban Park in Palayam.

Urban Housing

Over the past decade, the Government of Kerala has placed particular emphasis on expanding housing opportunities for the homeless, with a focus on maintaining quality and standards. A comprehensive housing programme known as LIFE Mission, has been launched to provide improved housing options for the poor. The houses constructed under the CSS scheme, Pradhan Mantri Awas Yojana (PMAY- U), for urban areas are merged with LIFE. The detailed discussion is in Chapter 28, Initiatives for a New Kerala.

Way Forward

Over the next decade, Kerala should focus on deepening decentralisation by strengthening the fiscal and functional autonomy of LSGs, enhancing their planning capacity, and institutionalising evidence-based decision-making through empowered District Planning Committees. It is essential to strengthened and Gram Sabhas, institutionalised Ayalsabhas, establish digital platforms for wider participation, and make targeted efforts to ensure the inclusion of youth, students, guest workers, and resident associations.

Equally important is the modernisation of planning institutions — Working Groups, Planning Committees, District Planning Committees, and District Resource

Box 19.1
Urban Policy Commission

The Kerala Urban Policy Commission was constituted in the year 2023. The Urban Commission, the first in India, has provided a comprehensive, evidence-based framework to align spatial planning and climate resilient policies, investment in local economic development by acknowledging the key growth drivers, and innovative interventions in collective local governance, sustainable urban finance, thereby addressing challenges and opportunities in health and well-being, habitat and build environment, ultimately promoting culture and heritage of the people of Kerala. The Commission identified major challenges including climate vulnerabilities, infrastructure gaps, spatial planning inefficiencies, fiscal dependence, and inadequate local governance capacity. The Commission underscores the importance of decentralised, participatory governance and proposes a transformative urban agenda rooted in evidence-based spatial planning, climate-smart infrastructure, equitable service delivery, sustainable financing, and inclusive local economic development. It recommends establishing Metropolitan Planning Committees, professionalising urban LSGs, investing in digital and climate resilience tools, leveraging heritage and cultural assets, and creating and supportive institutions such as a School of Urban Governance. The report aligns with global sustainable development frameworks while proposing Kerala-specific innovations such as the Jnanashree Programme and Kerala Urban Knowledge Partnerships, aiming to create fairer, resilient, and inclusive cities.

Centres — through the integration of professional expertise, digital tools, spatial planning capabilities, and robust data systems. LSGs must adopt watershed-based development, climate-resilient planning, and SDG-linked strategies, supported by updated geo-spatial datasets, open-access digital information, and enhanced documentation systems.

The next phase of decentralisation should essentially concentrate on employment generation, local economic development, gender-responsive planning, and targeted interventions for marginalised communities, ensuring effective convergence across departments and missions. The future economic development of the State must be grounded in a local economic development framework, based on the State's resources. Innovative measures to promote local economic development should be implemented across all sectors. LSGs must evolve into hubs of local entrepreneurship by transforming into agencies that provide technical expertise, mentorship, and managerial and financial assistance.

Social protection must remain a priority by sustaining the gains of the Extreme Poverty Eradication Project (EPEP), strengthening inter-departmental convergence, and ensuring livelihood rehabilitation for vulnerable households. Strengthening social auditing, ensuring eco-friendly construction practices, revitalising unused assets, and enhancing the capacity building of officials will be critical for improving public service delivery.

Urban governance requires scaling K-SMART, improving mobility, housing, water supply, sanitation, and modernising the Ayyankali Urban Employment Guarantee Scheme with skill-linked jobs. Waste management must transition to a circular economy model through strengthened Haritha Karma Sena, decentralised treatment systems, and increased public awareness.

In the backdrop of growing urbanisation, new approaches to urban administration must be devised, with a focus on generating own resources through multiple sources, climate-resilient infrastructure planning, state-of-the-art civic amenities, public spaces, employment opportunities, local business promotion, and livelihood security for the urban poor, among others. This also warrants the preparation and implementation of customised urban plans, with the participation of people.

Finally, Kudumbashree should be positioned as a central pillar of local development, with expanded micro-enterprises, producer groups, digital marketing platforms, agricultural and livestock initiatives, and innovation-driven livelihoods to ensure inclusive, sustainable, and community-led growth across Kerala.

Ultimately, the decade ahead calls for a deeper, technologically-enabled, participatory, and convergence-driven decentralised governance system that place people at its centre, and are capable of addressing emerging social, economic, and environmental challenges while sustaining Kerala's long-standing commitment to inclusive and transformative development.

Chapter 20
Environment and Growth

Global Warming and Climate Action: A Perspective for Kerala

Kerala occupies an important place in India's climate discourse, balancing rich natural heritage with progressive climate action. This chapter offers a science-based perspective on global warming and climate strategies for Kerala, highlighting the State's remarkable status as a carbon sink and its commitment to sustainable development. It explores how Kerala economy's low emission intensity, low energy consumption, and exceptional forest cover have historically shaped its developmental outcomes, and why the State must focus on adaptation and resilience rather than mitigation in its future policies and plans. By prioritising pragmatic adaptation measures, Kerala not only contributes positively to India's environmental goals, but also ensures continued growth, justice, and development for its people in the face of the emerging climate challenges.

Kerala is rich in natural resources, flora and fauna– all of which are of economic, social, and cultural significance to its people. Kerala's relationship with nature is not just about conservation; it is tied to livelihoods, societal well-being, and cultural identity. The State's agriculture, fisheries, and tourism sectors depend on healthy ecosystems.

Natural disasters and the toll they take provide a regular reminder of the climate vulnerability of the State and its people, which will be exacerbated by ongoing global warming if adequate attention is not paid to adaptation and resilience. These disasters are also sharp warnings that tell us that the impact of natural hazards depends as much, if not more, on the risks created by unplanned human economic activities as on the scale of the hazard itself.

The impact and consequences of global warming are far-reaching, and the nature and extent vary across sectors. In this chapter, we note some of the specific features of the impact of global warming on the State of Kerala from a policy perspective, and the kind of climate action that is required.

Introduction

Global warming of anthropogenic origin is not a local environmental question in essence, but is a uniquely global challenge, that demands collective action on the global scale. Global mitigation of greenhouse gas emissions is a public good or equivalently fair access to the global carbon budget is a "global commons" to which all countries must have equitable and fair access. Given this setting, free-riding and moral hazard issues take on much greater significance than in many other environmental issues such as water, chemical waste or air pollution– issues that are much more local in character.

The complexity of the issue is compounded by the reality that the free riders are the developed countries and the most prominent actors implicated in the moral hazard are also the global rich. Developing countries are left to suffer the consequences. They face the twin challenge of serious limits to the use of fossil fuel resources for improving energy access and industrial growth and development, thus slowing down critical socio-economic transitions that are essential to growth and development, both due to the pressure of the global climate regime, as well as the sheer unavailability of carbon space to allow fossil-fuel driven growth to meet at least moderate levels of income and well-being. On the other hand, despite the relentless pressure to "decarbonise", the requirements of both financial resources and technologies for developing countries are far from being met.

In the absence of the resource transfers on the scale required for mitigation in the global South and in the absence of adequate climate action from those who command the resources to do it, much of the discussion on the mitigation of Greenhouse Gas (GHG) centres, unsurprisingly, around a moral imperative thrust on all of humanity. The crux of this discourse of "moral" imperative of climate action, is that it undermines the fundamental principle of global climate action, namely that of "common but differentiated responsibilities" (CBDR). This principle emphasises that, while all countries share the responsibility to address climate change, their specific actions and obligations should reflect their differing capabilities and their current and historical contributions to the problem. This is in sharp contrast to the moral argument that emphasises the common but ignores the differentiation.

One of the key specificities of Kerala, unlike other States, is that in several core sectors, the environmental context of the State gives it not the status of a carbon emitter, but that of a *carbon sink*.

It follows that the primary responsibility of Kerala's planning framework is not to focus on further reductions in carbon emission intensity, or in absolute emissions. National climate policy does not put absolute

emission reduction on India's climate agenda. In such a context, the talk of absolute emission reduction in Kerala is unwarranted. But even within the scope of India's climate policy focus on reducing the emission intensity of the economy (measured by the emission intensity of GDP), the scope for reduction is not very much in Kerala. On the other hand, planning and investment strategies must clearly focus on adaptation. It is also worth examining the co-benefits of adaptation in Kerala, which would also open new opportunities, especially in the fields of agriculture and tourism.

Tracking and accounting of greenhouse gas emissions

Parties to the United Nations Framework Convention on Climate Change (UNFCC) are obliged to conduct greenhouse gas inventories and report them on an ongoing basis, with more rigorous reporting requirements on developed countries. Developed country parties are required to submit an annual GHG emissions inventory and a National Communications (NC) every four years, while developing country parties have considerably more flexibility in this regard. Following the Cancun Agreements of the UNFCCC in 2010, developed country Parties submit a Biennial Report (BR) while developing countries are to be encouraged to submit a non-mandatory Biennial Update Report (BUR). These BRs and BURs together with the NCs are an essential source of national level data across the world on emissions, detailing national data on anthropogenic greenhouse gas emissions by various sources, and an overview of the removal of greenhouse gases by various means (i.e., sinks). They include detailed information on sources and sinks of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and other GHGs.

Subsequently, under the Paris Agreement, following its implementation from 2020, all Parties, both developed and developing, are required to submit Biennial Transparency Reports from 2025, in place of the BRs and BURs.

While the communications noted above are part of the accountability and emissions tracking dimensions of the climate regime, Parties' commitments to climate change mitigation under the Paris Agreement are provided in the Nationally Determined Contributions, to be updated every five years being informed by the Global Stocktake, which is the five-yearly review of the implementation of the Paris Agreement. Parties' long-term goals, including, inter alia, the year of reaching net zero are submitted in the Long-Term Low Emission Development Strategy (LT-LEDS) that has no particular requirement of periodicity. Unlike NDCs that have a shorter-term horizon (typically 5 years), LT-LEDS looks decades ahead, often 50 years or so. However, they place the NDCs in the context of countries' long-term planning and development priorities, providing a vision and direction for future development, equity and "Common but Differentiated Responsibilities and Respective Capabilities in the light of different National Circumstances" (CBDR-RCNC) (Article 2.2 of the Paris Agreement). All the signatory countries have a "common" responsibility to address global environmental degradation, but individual responsibilities should be tailored to each country's historical and current emissions profile and its economic, social,and technological capabilities.

The latest information on India's greenhouse gas inventory is available in the Biennial Update Report (BUR-4) submitted to the UNFCCC in December 2024, which contains data up to 2020. India also submitted the latest National Communication in 2023 with the title, "India: Third National Communication and Initial Adaptation Communication" based on 2019 data. Similar to India's National Greenhouse Gas Inventory, a report has been released on Kerala's greenhouse gas inventory (Kerala GHG Inventory Report) in 2024 by the Department of Environment and Climate Change, Government of Kerala.

Methodology

Estimates of greenhouse gas emission and removal are divided into main sectors, which are groupings of related processes, sources and sinks. An inventory of anthropogenic greenhouse gases is prepared across five categories: Energy; Industrial Processes and Product Use (IPPU); Agriculture, Forestry, and Other Land Use (AFOLU); Wastes; and Others, except for aviation and maritime fuel use.

Estimating a country's total greenhouse gas emissions, can be production-based, or consumption-based. When all the emissions produced within a country are added together, it is production-based accounting. Alternatively, when emissions associated (though the term associated needs adequate clarification) with goods and services consumed within that country are added together, it is consumption-based accounting.

Countries are required to compile greenhouse gas inventories based on production-based accounting (PBA). This includes carbon emissions emitted within a country's borders, as well as carbon absorbed and sequestered by sinks. Per capita carbon emissions are

calculated based on the country's total production-based GHG. PBA includes exports but not imports. The carbon footprint is calculated based on consumption.

In greenhouse gas accounting, agriculture includes enteric fermentation, manure management, rice cultivation, agricultural soils, and field burning of agricultural residues. The first two are from the livestock farming sector and only the last three are from typical crop-related agricultural activities.

LULUCF (i.e., Land Use, Land Use Change, and Forestry) in GHG accounting includes GHG emissions and removals from various kinds of land use change,and forestry. In the LULUCF sector, deforestation and land degradation, for instance, leads to greenhouse gas emissions, while carbon dioxide sequestration occurs in vegetation, and soils (and wood products). LULUCF has seven components covering croplands, forests, grasslands, wetlands, settlements, other land uses (rocks, barren lands, ice-covered lands, etc), and Harvested Wood Products (HWP). AFOLU (Agriculture, Forestry, Other Land Use) brings together agricultural practices and LULUCF.

AFOLU Sector Emissions in Kerala

Regarding State-level (or in general, sub-national) inventories of GHG emissions, some caveats must be set forth at the outset. In contrast to national GHG inventories that follow appropriate IPCC guidelines, as approved and accepted by Parties at the UNFCCC, there is no accepted procedure or methodology for sub-national inventories. However, the enthusiasm for determining sub-national targets for mitigation, often, though not always, driven by the encouragement of developed country governments and their civil societies and academia, has led to ad hoc procedures being evolved for such sub-national inventories that are then sought to be placed on par with the inventory methodology of the IPCC and the UNFCCC.

One of the primary difficulties with sub-national inventories is that the distinction between production- and consumption-based accounting becomes much more tenuous at the sub-national level. Sub-national jurisdictions are not viable stand-alone economic units, or only partially so, which do not even approximately balance production and consumption within their boundaries, and thus do not allow for production-based accounting or consumption-based accounting at that scale.

Sub-national scale productive activities are marked by considerable inter-dependence across different sub-national units. The sharing of their natural resources is born out of society's sense of national unity and national cooperation, and it would be invidious politically to allow comparison of emissions to disturb such sharing arrangements. The difficulties over water-sharing do not bode well for extending competitive considerations to other natural resource sectors, including carbon space. For example, much of the electricity consumed in Kerala is produced in the power plants located in eastern Indian States. Thus, higher emissions in, say Jharkhand or Chhattisgarh, may be for higher consumption in States like Kerala.

Inventories are also, or perhaps even primarily, tools to determine where mitigation effort should be focused. In that perspective, while tolerating some assumptions, it would be worthwhile to make some broad estimates of emissions associated to Kerala's economy that would aid Kerala's climate actions. One such estimate is provided by a civil society initiative (GHGPI, 2018) that has been cited in "Kerala's State Action Plan on Climate Change 2.0".

Table 20.1 *Sector-wise GHG emissions, Kerala, 2005 to 2021* in million tonnes of CO_2e

Sectors	2005	2010	2015	2020	2021
Energy	18.12	15.95	17.04	16.96	17.24
Agriculture	2.02	1.77	1.61	1.56	1.56
LULUCF	−13.53	−18.26	−18.15	−10.26	−10.26
IPPU	1.47	1.45	1.34	1.22	1.32
Wastes	1.84	1.81	1.69	1.74	1.75
Gross emission excluding LULUCF	23.46	20.97	21.68	21.48	21.86
Net emission including LU-LUCF	9.94	2.71	3.53	11.22	11.60

Source: Department of Environment and Climate Change, Government of Kerala

In 2021, Kerala's total greenhouse gas emissions were +21.9 Mt of CO_2e excluding LULUCF (Table 18.1). The LULUCF sector was a net sink to the tune of -10.3 Mt of CO_2e. After deducting for LULUCF, the net greenhouse gas emissions in Kerala were +11.6 Mt of CO_2e. The energy sector contributed 79 per cent of the total emissions. It was followed by the waste sector with 8 per cent of the total emissions. The agriculture sector, including livestock, came a distant third with just 7 per cent of the total emissions. In other words, the energy sector was the largest contributor to greenhouse gas emissions in Kerala, as is the case at the national level.

If the contribution of agriculture in total emissions was 7 per cent, 5 per cent within it came from livestock farming and just 2 per cent within it came from crop production. "Crop production" here includes annual crops only, such as rice, cassava, yams, banana, and vegetables. Although tropical tree crops,such as coconut and rubber, are ubiquitous and are grown substantially in homesteads and plantations, these are considered as part of "forest cover outside the recorded area" and are accounted as part of forests.

Out of the 2 per cent of the State's emissions under crop production, nitrous oxide (N_2O) from cropland contributed 1.2 per cent and methane from paddy cultivation contributed 0.8 per cent. Even if we add burning of agricultural residues, the total emissions would still be under 2 per cent.

In other words, although "agriculture" is the third largest emitting sector in the order of emissions, its contribution is at least ten times less than the lead emitting sector i.e., energy. Further, the contribution of agriculture has shown a decline over the years. The following reasons can be attributed to the low emissions from the agricultural sector.

- Area under cultivation of rice in Kerala decreased from 8.8 lakh ha in 1974-75 to 2.1 lakh ha in 2020-21 (and by 2023-24 to 1.8 lakh ha). Because of the decline in area, there was a significant reduction in methane emissions from paddy fields.
- In 2020-21, the average nitrogen fertiliser consumption at the national level was 99.6 kg/ha. However, in Kerala, it was only 34 kg/ha. This implied that there was significantly lower nitrous oxide emission from fertiliser use in Kerala.
- In 1987, the cattle population in Kerala was 34.2 lakh. It declined to 13.4 lakh in 2019, and to 9 lakh in 2024. There was a natural corresponding reduction in enteric fermentation of cattle, a major source of methane emissions. This is interesting, even if not of great significance in absolute terms, since declining methane emissions is a source of cooling, due to the short-lived nature of methane in the atmosphere.

The LULUCF Sector

The LULUCF sector in Kerala is a major sink through the sequestration of carbon. In 2021, LULUCF removed 47 per cent (or 10.26 Mt of CO_2e) of the gross CO_2e emissions from the State. Forest cover contributed 97 per cent to the total carbon sequestration in the State, while croplands contributed 2 percent, and settlements contributed 1 percent.

What is striking is that while the LULUCF sector at the national level removed just 22 per cent of gross emissions, the LULUCF sector in Kerala removed 47 per cent of the gross emissions. Following the definitions followed in the Forest Survey of India (FSI), in 2021, the forest cover in India was 21.7 per cent while the forest cover in Kerala was 54.7 per cent. This was because of a high share of the "forest cover outside the recorded area" in Kerala, which includes areas cultivated with rubber, coconut, areca nut, oil palm, cashew, tea, coffee, jackfruit, mango, and other such crops.

A disaggregation of the carbon sequestered by Kerala's forest cover shows the contribution of farmers growing perennial tree crops. If the sequestration by LULUCF stood at 47 per cent of the gross emissions, the sequestration by tree crops grown by Kerala's farmers and the sequestration from crop lands together stood at 25 per cent of the gross emissions.

The carbon balance of crop production including tree crops can be narrated in a simple illustrative form. In 2021, the emissions generated by crops were only 2 per cent of the gross emissions, but the sequestration due to crops, including tree crops,was 25 per cent of the gross emissions. In other words, there was excess carbon capture in Kerala's agricultural sector. Thus, crop production in Kerala was carbon negative by 23 per cent in 2021.

If we add up LULUCF and agriculture, i.e., if we considered AFOLU,the total emissions were 7 per cent of the gross emissions and sequestration was to the tune of 47 per cent of the gross emissions. Thus, the net sequestration was 40 per cent of the gross emissions in 2021.

Kerala's low emissions intensity in the fossil fuel sector and its low per capita energy consumption are also partly the reasons for the considerably higher proportion of absorption of emissions by Kerala's AFOLU sector, compared to the absorption at the national scale (Table

Table 20.2 *Rank of 20 States in India in selected parameters* 2019-20

State	Rank of each State (higher rank for higher value)			
	Emission intensity	Per capita energy consumption	Percentage change in forest cover	Forest carbon stock
Andhra Pradesh	9	14	5	15
Assam	17	19	14	5
Bihar	7	20	7	13
Chhattisgarh	1	8	19	8
Gujarat	14	2	15	17
Haryana	14	1	17	19
Himachal Pradesh	19	7	10	1
Jharkhand	2	16	11	14
Karnataka	16	6	8	4
Kerala	**19**	**13**	**2**	**3**
Madhya Pradesh	4	15	18	12
Maharashtra	12	9	16	7
Odisha	3	11	9	9
Punjab	11	4	4	18
Rajasthan	7	12	12	20
Tamil Nadu	12	5	3	10
Telangana	9	3	6	16
Uttar Pradesh	5	18	13	11
Uttarakhand	18	10	20	2
West Bengal	6	17	1	6

Source: NITI Aayog

20.2). This correlates appropriately with Kerala's economic growth performance in the productive sectors, including low levels of productivity in agriculture, the absence of factory-type manufacturing enterprises, and low levels of power production. At the same time, Kerala does contribute to maintaining forest cover and sequestering carbon in the forests.

These two contrasting performances, between low energy use and maintaining forest cover that sequesters a larger proportion of emissions, typically feed into each other in the long run and make for a complex developmental challenge. But the inference is clear: a rise in economic growth in Kerala, particularly in the productive sectors, may require higher emission intensity and higher per capita energy consumption in the future. How best Kerala can achieve it, without performing unduly poorly in carbon removal and sequestration, will be a challenge for policy makers in the coming years.

Mitigation or Adaptation?

Globally, it is becoming increasingly clear – scientifically – that if humankind must try to limit temperature increases to 1.5 degree Celsius or 2 degree Celsius above the pre-industrial level, there must be a limit to the cumulative emissions of carbon dioxide, among other greenhouse gases, from the entire world. This limit on the cumulative emissions of carbon dioxide is referred to as the global carbon budget.

But a large share of the global carbon budget – which is a common resource of all humanity – has already been exhausted by the developed world. Thus, the challenge to the developing world today is to ensure that the remaining global carbon budget is equitably shared between and within countries, while the developed countries provide climate finance on a scale that is benchmarked by their carbon debt from their historical emissions. Such a fair share of the global carbon debt is necessary if developing countries are to achieve a higher

level of economic development, which in turn will provide their people with a decent level of well-being. This requires the continued use of fossil fuels in the developing world until viable alternatives are available, at least in key sectors where either substitution of fossil fuel-based energy is difficult, for both technological and financial reasons,or the scale and speed of green energy deployment cannot meet the urgent needs of the present, as in poverty eradication, the guarantee of food security and the provision of health at reasonable levels of expenditure.

It is in this context that the distinction between mitigation and adaptation must be understood and discussed. It is important that Kerala, indeed like India itself, must pay far greater attention to adaptation strategies to address the impact of climate change rather than mitigation.

The strategic choice of adaptation must also be linked to the urgent need in Kerala to raise economic growth rates, reduce unemployment, invest in infrastructure and improve the material conditions of people's lives. Such a choice is also demanded by the imperatives of climate vulnerability. Given the extremely low per capita emissions, even if Kerala reduces its carbon emissions, its impact would be close to zero in terms of global or national emissions. At the same time, Kerala will remain, and continue to be, vulnerable and prone to extreme climate events and other impacts of climate variabilities. The State will continue to face floods, extreme rainfall, coastal erosion, sea level rise, landslides, and soil degradation. The necessity, then, is to adopt adaptation strategies and be resilient to climate variabilities. This will require resilient infrastructure, early warning systems, flood management and other related measures. Needless to say, such a choice is also firmly rooted in the equity principle. Kerala too deserves its own share as part of India's rightfully larger share in the global carbon budget.

Agriculture

Agriculture is an area where the need for adaptation strategies is paramount, particularly when Kerala's yield gaps are large. In agriculture, rising climate variabilities would necessitate investing heavily in adaptation research, including the development of new seeds that are not just high-yielding but also drought-tolerant, flood-tolerant, salinity-tolerant, acidity-tolerant and heat-tolerant. Investments will also be required in soil and water conservation, such as in contour bunding, rainwater harvesting, watershed schemes, and new irrigation projects. In areas that may face water shortage, investments would also be required in micro-irrigation, such as drip and sprinkler irrigation structures.

The choice of adaptation strategies as the key to India's climate actions,aligns well with India's pragmatic stance in the UNFCC negotiations. India's argument has been that majority of its carbon emissions in agriculture are "survival emissions". Smallholder agriculture and livestock farming, and the survival incomes they generate for millions of Indians, cannot be realistically compared to the higher overall emissions of the developed world, and some large emerging economies. It is worth quoting from India's Third "National Communication and Initial Adaptation Communication" submitted to the UNFCCC in 2023:

"It is to be noted that agriculture is not included in LT-LEDS (Long-Term Low Emission Development Strategy), given its predominantly adaptation-related character; especially in the context of India's agriculture, which has predominance of small and marginal farmers. The absence of large-scale or 'industrial agriculture' in India indicates that the burden of mitigating GHG emissions from other sectors cannot be passed on to the agricultural sector."

Such a position has also been reiterated in the "Kerala GHG Inventory Report" of the Government of Kerala published in 2024.

Non-agricultural sectors

Similarly, Kerala's low per capita emissions are strongly correlated with its low per capita energy consumption. Rising temperatures in the future would require further strengthening public healthcare. More frequent floods would require not just flood-tolerant seeds in agriculture, but also large investments in drainage and related engineering interventions. In such a situation, cutting down on carbon emissions would be a socioeconomically regressive measure. Investments in adaptation will have to be made not just through domestic budgetary provisions, but also through mobilising capital and technology from a variety of sources, including globally from the "Loss and Damage Fund".

Adaptation would also be the required strategy in sectors like housing and transport. In the housing sector, Kerala needs climate resilient infrastructure that includes flood-resistant construction techniques (such as the elevated houses in Kuttanad); elevated electrical systems in flood zones; landslide-resistant settlements (such as terracing and slope stabilisation in the highlands); relocation of communities in the hazard zones; and heat-adaptive roofs, ventilation, and

walls in houses. In the transport sector, Kerala needs climate-proofed mobility networks, which will demand attention to be given to the conditions of flooded roads, landslide-blocked highways, and ports in areas of coastal erosion. The solutions will include flood-resistant road design that includes elevated highways, stabilisation of retaining walls in the roads in the highlands, expansion of inland waterways, floating bus stops in waterlogged areas, and compulsory construction of culverts and higher embankments on the roads.

In Kerala, adaptation measures can be effectively planned and implemented, leveraging the State's strong governance linkage between the State, District and local scales. Adaptation is a multi-scalar challenge, and neither local self-government nor the State-level governance machinery can work in a condition where either one dominates the other.

Conclusion

Climate change is not merely an environmental concern, but is deeply rooted in the debates on equity, justice, and the right to development. The present global narrative on climate change overlooks the disproportionate burden carried by vulnerable communities, particularly in developing countries like India. Countries like India, and States like Kerala, cannot be expected to sacrifice their "survival emissions" while the wealthier nations continue their "luxury emissions" unchecked.

Kerala strikingly contributes to India's low emissions footprints as one of those with the most effective sinks of carbon among all Indian States. Yet, it is also a region deeply vulnerable and prone to climate shocks. In this context, Kerala's path forward in climate policy must be guided by pragmatism, fairness and a commitment to growth and developmental equity. Kerala must expressly prioritise adaptation over mitigation in its climate policy. Kerala's adaptation policies must be inclusive, decentralised, and tailored to the socioeconomic realities of each region. In doing so, it would not only address the climate challenge more effectively but also uphold the rights and dignity of the most affected people and communities.

Learning from Disaster: The Kerala Experience

Over the past decade, Kerala has emerged as a national and international reference point in disaster management, having responded to a succession of unprecedented disasters, including floods, landslides, cyclones, epidemics, and public health emergencies. While each crisis tested the State's institutional capacity, the State Government has consistently demonstrated effectiveness with respect both to immediate disaster response and to long-term recovery.

A defining feature of Kerala's success in disaster management has been the combination of decentralised, participatory governance with strong command and coordination. Local Self-Governments, community organisations, volunteers, and civil society groups played a central role in relief and rehabilitation, while political leadership ensured clear decision-making and resource mobilisation. The State's advanced human development indicators and extensive social welfare systems enabled rapid deployment of relief, rehabilitation, and livelihood restoration measures. Equally important were innovations in communication, data management, and the use of digital technologies, supported by skilled youth and the global Malayali diaspora.

Kerala's disaster governance has attracted wide recognition, media attention, and scholarly interest, offering valuable lessons for disaster management in India and beyond.

Conceptual Change in Disaster Management

The shift towards Disaster Risk Reduction began in 1987, when the United Nations declared the 1990s as the International Decade for Natural Disaster Reduction. Over the following decades, three major world conferences on disaster risk reduction held in Yokohama in 1994, Kobe in 2005, and Sendai in 2015, shaped international understanding of how societies should manage risk.

The Yokohama Strategy recognised that sustainable development and disaster risk reduction are interconnected. This idea was reinforced in later global agreements, including the Johannesburg Plan of Implementation (2002), the Hyogo Framework for Action (2005–2015), the Rio+20 outcome document The Future We Want (2012), the Sendai Framework for Disaster Risk Reduction (2015–2030), and the 2030 Agenda for Sustainable Development. Together, these frameworks place disaster risk reduction at the centre of development planning.

The Sendai Framework sets out four priorities for action between 2015 and 2030. These are understanding disaster risk; strengthening disaster governance to manage disaster risk; investing in disaster risk reduction for resilience and for enhancing disaster preparedness for effective responses; and "build back better" in recovery rehabilitation and reconstruction. The World Congress on Disaster Management held in Mumbai in 2019 reaffirmed global commitment to the Sendai principles.

Vulnerability Assessment of Kerala

Kerala's exposure to disasters arises from its distinct geography, dense population, and patterns of land use and development. The State's multi-hazard profile was first mapped by the National Centre for Earth Science Studies, which provided the scientific basis for policy and planning. Kerala is vulnerable to 17 natural hazards and 22 anthropogenic hazards, each of which carries the potential to disrupt lives and livelihoods.

The 17 natural hazards include floods, landslides, drought, coastal hazards, strong winds, lightning, earthquakes, human epidemics, plant and crop diseases, avian diseases, animal epidemics, pest infestations in human settlements, forest fires, meteorite impacts, soil piping, heat-related illnesses, and exposure to natural background radiation.

The 22 anthropogenic hazards include stampedes, firecracker accidents, accidents during the transport of petroleum products, industrial accidents, dam-related failures, oil spills, road accidents, human-induced forest fires, human–wildlife conflict, fires in buildings and marketplaces, boat capsizing, accidental drowning, building collapse, hooch-related incidents, air and rail accidents, acts of terrorism and civil unrest, nuclear and radiological accidents, space debris impacts, biological accidents, hazards in occupational and recreational settings, and accidents within armed forces facilities. There are also incidents that occur outside Kerala but have consequences within the State, such as industrial or nuclear accidents in neighbouring regions.

The Kerala State Disaster Management Authority updated the State's multi-hazard vulnerability and risk assessment in 2022. This assessment ranked all 1,034 LSGs, including Gram Panchayats, Municipalities, and Municipal Corporations, according to their relative levels of risk (Table 20.3). The results show substantial variation across Districts reflecting differences in terrain, settlement patterns, and environmental pressures. This localised understanding of risk forms a core element of Kerala's disaster governance framework, as it enables the State to design targeted interventions and allocate resources where they are most needed.

The experience of facing several major disasters in close succession has reinforced the need to integrate disaster risk reduction into every stage of development planning of Kerala. A clear and current recognition of vulnerability is therefore the starting point for building a safer and more resilient Kerala.

Unprecedented Crises

Kerala has faced a series of crises that varied in origin and scale and demanded different forms of response in the last decade. These include the droughts, floods, landslides, cyclones and biological outbreaks. These events, occurring in close succession, tested Kerala's systems and shaped its present approach to disaster management.

Cyclone Ockhi, 2017. Cyclone Ockhi was a severe cyclonic storm that hit Kerala on November 30, 2017, with wind speeds of around 155 km/h (three-minute duration) and 185 km/h (one-minute duration), and

Table 20.3 *Risk assessment of Local Self-Governments in Kerala, 2022*

District	Number of LSGs in various risk categories			
	High risk	Low risk	Moderate risk	Total
Thiruvananthapuram	4	43	31	78
Kollam	13	29	31	73
Pathanamthitta	6	29	22	57
Alappuzha	13	22	43	78
Kottayam	4	40	33	77
Idukki	12	24	18	54
Ernakulam	13	48	35	96
Thrissur	23	17	54	94
Palakkad	16	37	42	95
Malappuram	14	50	42	106
Kozhikode	7	33	38	78
Wayanad	16	2	8	26
Kannur	7	45	29	81
Kasaragod	4	28	9	41
Total	152	447	435	1034

Source: Kerala State Disaster Management Authority

it caused extensive damage across the State. The Ockhi cyclone of 2017 was notified as a disaster eligible for assistance from both the National and State Disaster Risk Management Funds. In response, the Government of Kerala announced a compensation package of Rs 20 lakh for the next of kin of each deceased fisherman and Rs 5 lakh for seriously injured fishermen. Families whose working members were unable to go to work due to the cyclone were provided daily assistance of Rs 65 per adult and Rs 40 per child, either for one month or for the duration of disruption, along with one month of free ration. The Government also ensured free education, vocational education, and skill training for the children and dependents of deceased or missing fishermen, and provided alternative livelihood opportunities for affected fishermen.

Nine Districts were affected by Cyclone Ockhi, namely Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode, Kannur, and Kasaragod. As a result of the cyclone, 51 fishermen died at sea (50 from Thiruvananthapuram and one from Kasaragod), one fisherman died at the Kannur harbour, and seven non-fishermen lost their lives on land. In addition, 91 fishermen from Kerala went missing. The cyclone caused widespread damage, particularly in Thiruvananthapuram District, where coastal areas and fishing communities were severely affected due to the destruction of boats and the need for emergency evacuations.

Relief efforts included the distribution of free food and financial assistance to affected families. In Alappuzha, flooding and damage to fishing equipment were reported, and the Government provided rations and cash relief. Kollam established relief camps due to extensive damage, while Ernakulam received assistance for damaged fishing infrastructure and Thrissur for agricultural losses. Malappuram and Kozhikode experienced coastal erosion and significant losses within the fishing community, with compensation and food support extended to affected households. In Kannur, coastal warnings were issued and temporary shelters were set up, while Kasaragod faced disruptions to fishing livelihoods and received support for repair and recovery. A District-level damage assessment was initiated to guide future compensation, rehabilitation measures, and coastal protection efforts.

Nipah outbreak, 2018. In May 2018, Kerala experienced its first Nipah virus (NiV) outbreak, with 18 laboratory-confirmed cases and 17 deaths reported across Kozhikode and Malappuram Districts. As reported in the Disease Outbreak News published by the World Health Organisation on May 31, 2018, three deaths due to NiV infection were reported on May 19 from Kozhikode District, Kerala State. Three of the four reported deaths were confirmed positive for NiV by real-time polymerase chain reaction (RT-PCR) and IgM ELISA tests for NiV.

The Government of Kerala implemented a rapid and coordinated public health response with the isolation of cases, intensive contact tracing, and strict infection-control measures. Over 2,600 contacts were traced for follow-up, symptomatic individuals were tested for NiV, and both syndromic and hospital surveillance were enhanced in the region. The State worked closely with national agencies such as the National Centre for Disease Control and the National Institute of Virology, and prioritised transparent and regular public communication. These interventions successfully contained the outbreak within weeks, earning recognition from the World Health Organization for effective disease control.

Nipah outbreaks in subsequent years have been swiftly contained with the protocol developed in 2018, and the continued efficiency of the State's health and governance systems.

Floods of 2018, 2019, 2020, and 2021. The 2018 floods were a cataclysmic extreme rainfall event which submerged nearly the entire State, and was declared a national calamity. It was the highest widespread rainfall event that the State faced in 100 years. The floods affected 1,260 (out of the 1,564) villages across 13 Districts. In the 2018 flood, around 450 people lost their lives. The State Government, supported by a wide mobilisation of civil society groups, students, voluntary organisations, and community networks, carried out extensive rescue and relief operations. National and State forces undertook coordinated operations, including teams from the National Disaster Response Force, the Army, the Navy, the Air Force, the Coast Guard, the Central Reserve Police Force, and other agencies. Fisherfolk contributed significantly, deploying nearly 3,000 volunteers and more than 600 boats across affected regions.

According to the Kerala Post-Disaster Needs Assessment (PDNA), 2018 jointly conducted by the Government of Kerala, UNDP, UNICEF, WHO, and the World Bank, more than 14.5 lakh people stayed in 3,879 relief camps. The estimated total damage and loss was Rs 26,720 crore, and assessed costs for recovery and reconstruction were roughly Rs 31,000 crore. The Government of Kerala supported 2018 flood-affected

people through immediate rescue operations, setting up relief camps, providing financial aid, compensating for losses, repairing homes and infrastructure, ensuring health and sanitation, supporting farmers and livelihoods, launching the Rebuild Kerala Initiative, using technology for transparent relief distribution, and mobilising community participation.

The Government of Kerala reorganised and re-prioritised its Plan schemes in the wake of the 2018 floods to focus on disaster recovery and building a more resilient State. These efforts continued in the Annual Plan in 2019-20.

In 2019, another major flood struck the State. The Government of Kerala implemented a comprehensive response to support flood-affected individuals. This included immediate rescue efforts, establishing relief camps, providing financial assistance, compensating losses, repairing homes and infrastructure, ensuring health and sanitation, and supporting farmers and livelihoods. Additionally, the Rebuild Kerala Initiative was launched, technology for transparent relief distribution was implemented, and community involvement in the recovery process was encouraged. A total of 1,038 villages in 13 Districts were officially recorded as affected by floods and landslides, and 125 lives were lost. Housing, power supply, agriculture, and related sectors experienced considerable disruption. Although the event placed fresh pressure on already stretched systems, the response drew upon the institutional experience gained in 2018 and demonstrated Kerala's growing capacity to manage large-scale emergencies.

Between June 1 and August 18, 2020, all 14 Districts in Kerala experienced severe rainfall. Four Districts — Idukki, Wayanad, Malappuram, and Kottayam — faced flooding, and 104 people lost their lives, with forty others injured. These events added to the wider pattern of extreme rainfall that the State has been experiencing in recent years.

Kerala experienced heavy monsoon rains in parts of the State in 2021. These rains caused localised flooding, inundation and waterlogging in several Districts. Some hill and Taluk-level landslides/slope failures were also reported. The combination of rain and terrain made certain hilly areas vulnerable. The rain and floods disrupted normal life in affected zones with damage to houses, roads, and bridges. People had to be evacuated, and agriculture suffered in many parts. The Kerala State Disaster Management Authority asserts the need to reduce hazards through mitigation, preparedness, response and recovery as Kerala is increasingly vulnerable to multiple hazards with flooding in 2018, 2019, 2020 and 2021 and the fact that around 14.5 per cent of Kerala is prone to landslides.

The Covid-19 Pandemic (2020-2021). Declaring Covid-19 a "State-specific disaster" allowed Kerala to deploy its entire administrative machinery under the Disaster Management Act. The Health Department acted as the nodal agency, supported by the Kerala State Disaster Management Authority's (KSDMA) response mechanisms and the State Disaster Response Fund (SDRF). KSDMA's early use of the SEIR (Susceptible, Exposed, Infected and Recovered) model to project the virus's spread informed the State's widely lauded containment strategy, showcasing a scientific and data-driven approach to a global health emergency. For a more detailed account of Kerala's efforts during the pandemic, see Kerala Development Report 2021.

The Government of Kerala announced a Rs 20,000 crore comprehensive economic package to mitigate the hardship caused by the pandemic and lockdown. Key components included Rs 2,000 crore for health sector strengthening (hospitals, testing, ICU expansion, PPE), Rs 2,000 crore for loans through Kudumbashree for small enterprises, Rs 1,000 crore for rural employment guarantee (MGNREGS), Rs 1,320 crore for welfare pensions and pension advance, Rs 100 crore for community kitchens, support for small businesses, farmers, and informal workers, subsidised loans and relief for Self-Help Groups and small entrepreneurs.

Landslides. Landslides occur mainly in association with Extreme Rainfall Events. The Kerala State Council for Science, Technology and Environment defines an Extreme Rainfall Event in Kerala as more than 120 millimetres of rain within twenty-four hours, which corresponds to the 99th percentile of rainfall for the State. Such events have increased in frequency and intensity in recent years and have produced several major landslides across different Districts.

During the 2018 floods, severe rainfall triggered 341 major landslides in 10 Districts, with Idukki alone accounting for 143 incidents. These events formed part of a wider disaster that affected one-sixth of Kerala's population and caused extensive damage across 1,260 villages. In August 2019, landslides occurred at Kavalappara, Malappuram district where an entire village was buried, and also in Puthumala, Wayanad which caused the loss of life and destruction of houses,vegetation, and infrastructure. In these events, 86 people lost their lives. The following year, in August 2020, continuous rainfall caused a large debris flow in

Pettimudi in Idukki, destroying workers' quarters and killing 70 people, many of whom were asleep at the time.

In October 2021, sustained heavy rain led to 69 reported landslides within two weeks, including a severe incident at Koottickal, Kottayam, leading to the loss of 13 lives. The disaster destroyed homes, blocked roads, and complicated rescue efforts, with flooding and soil erosion further increasing the damage.

In 2024, an extreme Rainfall Event of over forty-eight hours caused a major debris flow in Attamala–Mundakkai–Chooralmala in Wayanad, bringing widespread damage. On the same day, a significant landslide occurred at Vilangad in Kozhikode District.

These events underline the close relationship between extreme rainfall, terrain vulnerability, and human settlements in the Western Ghats, and they have reinforced the need for continuous monitoring, early warning systems, and strengthened land-use planning.

Attamala – Mundakkai – Chooralmala Landslide, 2024. On 30 July 2024, Meppadi Grama Panchayat in Wayanad experienced one of the deadliest landslides in Kerala's recent history. Triggered by an Extreme Extreme Rainfall Event, the area received 572.8 mm of rain within 48 hours, including 372.6 mm in the hours immediately preceding the disaster. In comparison, the 2018 floods recorded 818 mm of rain over two days. The landslide originated in the Punchirimattom Evergreen Forest at about 1,550 metres above sea level and generated a massive debris flow that swept through Punchirimattom, Attamala, Mundakkai, Chooralmala, and Vellarimala. The initial slope failure occurred shortly after midnight, between 12:30 and 1:15 a.m., and the debris travelled nearly eight kilometres at an estimated speed of about 100 km per hour. Channel widths expanded from 20–40 metres to nearly 300 metres in places, carrying over five million cubic metres of material. Temporary natural dams formed and collapsed, creating destructive surges. According to SDMA reports, the disaster claimed 298 lives. Three wards of Meppadi Panchayat were affected, displacing 702 families. Of the 2,007 housing units in these wards, 1,555 were destroyed or severely damaged and 452 partially damaged. Housing losses alone were estimated at Rs 227.37 crore, with additional damage to roads, bridges, civic infrastructure, agriculture (626 hectares of crops), livestock, and wildlife. As rehabilitation at the original sites is not feasible, the total reconstruction and recovery costs have been estimated at Rs 1,113.6 crore.

Rescue operations were initiated immediately by local residents, Aapda Mitra, and Civil Defence volunteers, despite the collapse of the main access bridge. The State organised a coordinated response within hours, led by a Cabinet Sub-Committee that functioned for two months. About 1,800 personnel were deployed, temporary access routes were created, electricity was restored within 16 hours, and the National Disaster Response Force — already pre-positioned — began operations promptly. The Navy, Army, Kerala Police, Fire and Rescue Services, Health Department, LSGs, NGOs, and community volunteers supported the response. Advanced tools such as drones, radar, cadaver dogs, helicopters, and ground-search teams were used extensively.

Over 630 people were rescued, and around 1,300 were relocated to safer areas. Seventeen relief camps housed 4,102 people and provided food, healthcare, counselling, banking services, and document restoration. Within 28 days, all 794 camp-resident families were shifted to temporary housing with monthly rent assistance of Rs 6,000, amounting to Rs 4 crore by May 2025. Immediate financial assistance of Rs 10,000 was provided to 1,013 families, along with livelihood support, free rations, drinking water, and essential supplies. Compensation under the State Disaster Response Fund included Rs 6 lakh per deceased family, Rs 50,000 for the severely injured, and Rs 50,000–Rs 75,000 for persons with disabilities.

Livelihood support of Rs 300 per day, or Rs 9,000 per month, was provided to one or two members of affected households for nine months, amounting to a total of Rs 9.1 crore. The Government also distributed monthly food kits worth Rs 1,000, restored lost documents, and ensured continuity of education for children from Vellaramala and Mundakkai. Additional assistance for orphaned children included Rs 10 lakh each for seven children who lost both parents, Rs 5 lakh each for seventeen children who lost one parent, monthly support under the PM Vatsalya scheme for those aged 18–21, and Rs 3 lakh per child through corporate social responsibility funding. Plantation and agricultural activities resumed on the fiftieth day, alongside continuous psychosocial counselling for affected individuals as well as Aapda Mitra and Civil Defence volunteers involved in rescue operations.

Long-term rehabilitation focuses on resettlement, livelihood restoration, and social recovery. A model township with 410 houses and full civic infrastructure is under construction at a cost of Rs 351.5 crore, including Rs 43.8 crore for land acquisition, and will accommodate 298 families. In March 2026, the

first phase of the model township (178 houses) was completed and handed over. Independent houses with land have been provided to 13 Scheduled Tribe families. Families opting out of relocation received Rs 15 lakh each. Much of the rehabilitation has been funded through the Chief Minister's Disaster Relief Fund, which received Rs 774 crore by November 2025.[1]

The response highlighted the strength of Kerala's decentralised governance and inter-sectoral coordination. The disaster highlighted the need for improved forecasting, scientific land-use regulation, and strengthened early warning systems in the Western Ghats.

Kerala State Disaster Management Authority, Disaster Governance, and Local Action

Kerala's success is underpinned by a governance architecture that integrates planning with implementation.

The Kerala State Disaster Management Authority (KSDMA), established under the Disaster Management Act, 2005 anchors the State's disaster governance. Its strength lies in combining scientific capabilities with decentralisation, working closely with District Disaster Management Authorities and Local Self-Governments (LSGs). Since 2016, Kerala has invested heavily in making disaster management a local, participatory, and anticipatory exercise, with all LSGs preparing disaster management plans under the Nammal Namukkayi framework and forming Disaster Mitigation Oversight Committees at the grassroots.

A major focus of KSDMA's work has been community-based preparedness. Disaster mitigation plans have been developed for vulnerable tribal settlements in Wayanad, youth have been trained in response skills, and special programmes have included the transgender community and school children. Rain and river monitoring networks in Wayanad, Kottayam, and Pathanamthitta, and the installation of school weather maps, reflect KSDMA's effort to democratise weather awareness. Thirteen temporary rehabilitation centres have also been established across the State.

The State Disaster Management Plan (2016-17), updated in 2018 and reaffirmed in 2024, aligns with the Sendai Framework. KSDMA has taken the lead in scientific flood-risk mapping, preparing and publishing detailed flood recurrence maps when national agencies were unable to do so in time, a first in India, empowering citizens and planners with critical risk information. These maps, which identify likely flood heights for recurrence periods up to 500 years, are publicly available and now guide local planning. The Rule Curve Monitoring Committee constituted under KSDMA has ensured coordinated reservoir management, helping avoid dam-related emergencies during intense monsoon years.

To support long-term climate adaptation, KSDMA and the Kerala Institute of Local Administration (KILA) jointly prepared climate-change scenarios for every local institution — an unprecedented exercise in India — covering temperature and rainfall shifts under different emission pathways up to 2099. These are now used by LSGs to update disaster management plans and development strategies.

KSDMA has also contributed significantly to modernising early-warning technologies. Its weather data feeds into the Water Resources Department's real-time flood-warning systems for the Pamba and Periyar basins. The Authority continues to expand weather-monitoring infrastructure and has advocated for additional Doppler radars and mobile X-band radars to improve intense-rainfall forecasting.

Strengthening safety in schools has been another area of work. The U-School app, launched with UNICEF, supports school-level disaster planning, while school disaster management clubs, teacher training, animated literacy materials and regular online sessions help build preparedness among children and youth. KSDMA also collaborates with the Geological Survey of India and the University of Kerala to advance landslide-warning capabilities.

Kerala's volunteer network, nurtured by KSDMA, is one of the strongest in the country. The State has been designated India's first Civil Defence State, with 15,000 trained volunteers linked to the Fire and Rescue Services. The Social Volunteer Force now includes 3.4 lakh registered members (roughly one for every 100 people, under a dedicated directorate), and the Aapda Mitra programme is being expanded across Districts. The Local Institutional Disaster Response Teams (LIDRTs) ensure a rapid, localised first response. These initiatives have been showcased nationally as a model for community-led response.

KSDMA, along with District Disaster Management Authorities, conducts extensive training, mock drills, and public outreach programmes, supports local emergency teams, and coordinates NGO efforts through the Inter-Agency Group. Awareness campaigns, monsoon-preparedness sessions, and accessible early warnings have broadened public understanding of risks.

[1] For details, visit https://donation.cmdrf.kerala.gov.in

Under the 14th Five-Year Plan, the Sajjam initiative seeks to reach every household with preparedness messages, establish Block-level emergency hubs, strengthen disaster financing systems, improve public alerting through ground-level sirens and location-based messaging, and prepare safety plans for all schools and hospitals. International collaborations with organisations such as the Netherlands Government, the Norwegian Geotechnical Institute, Asian Disaster Preparedness Center (ADPC), the World Bank, KfW, and the Asian Development Bank further strengthen the State's scientific and institutional capacity.

Financing Disaster Management

Effective disaster management depends on a predictable and responsive financial framework, and Kerala's experience shows the importance of such mechanisms, particularly when federal support is delayed or inadequate.

The Disaster Management Act, 2005 created two principal funds for disaster-related expenditure: the State Disaster Response Fund (SDRF) and the National Disaster Response Fund (NDRF). The SDRF is the primary source for immediate relief. Its financing follows a cost-sharing pattern, with the Union Government contributing 75 per cent for most States and 90 per cent for the North-Eastern and Himalayan States. The fund may be used for notified natural disasters such as floods, landslides, droughts, earthquakes, cyclones and cloudbursts, and up to 10 per cent may be used for locally significant hazards identified by the State.

NDRF supplements the SDRF when a disaster is of severe nature and when the State's own fund is insufficient. It is financed entirely by the Union Government and can also receive grants from individuals and institutions. Both SDRF and NDRF allocations are determined by successive Finance Commissions.

A major change in recent years has been the expansion of the funding architecture to include mitigation activities. Acting on the recommendations of the Fifteenth Finance Commission, the Union Government established the National Disaster Mitigation Fund (NDMF) and advised States to create State Disaster Mitigation Funds (SDMF). The Centre contributes 75 per cent of each State's SDMF (and 90 per cent for North-Eastern and Himalayan States). These funds mark a dedicated national mechanism for supporting disaster risk reduction efforts across the country.

Kerala has consistently pointed out that despite this statutory architecture, delays and administrative hurdles at the Union level often hinder timely access to support after major disasters. This experience has reinforced the State's dependence on its own institutional mechanisms — especially the Chief Minister's Disaster Relief Fund (CMDRF) — to ensure rapid and humane relief, rehabilitation, and long-term recovery.

Leadership in a Crisis: The Democratic Significance of Communication

In an era of misinformation and centralised control of narratives, Kerala's approach to public communication during disasters has been a hallmark of its democratic commitment. The Chief Minister's daily press conferences during crises such as the 2018 floods and the Covid-19 pandemic served multiple critical functions. They provided transparent, authoritative, and timely information directly to the public, quelling rumours and ensuring a unified understanding of the situation and Government directives. This practice exemplified a governance model that trusts and respects its citizenry, fostering widespread compliance and social solidarity. It highlights the importance of democratic accountability in crisis management.

Challenges and the Way Forward

Despite its achievements, Kerala faces formidable and evolving challenges that demand a renewed focus on adaptation. The State is experiencing an increase in the frequency and intensity of extreme weather events. Coastal erosion, sea-level rise, and emerging threats including heat waves and lightning storms require forward-looking adaptation strategies that go beyond conventional mitigation. Listed below are four major policy suggestions to build a resilient Kerala.

- *Science and technology for Disaster Risk Reduction (DRR).* State procurement policies to facilitate the piloting and adoption of new technologies for early warning, such as X-Band radars for micro-level rainfall prediction and advanced landslide warning systems.
- *Strengthening disaster risk governance.* Integrate principles of the Sendai Framework and the findings of the IPCC's AR6 report into the Five-Year Plan, making risk-informed master planning mandatory for all LSGs.
- *Investing in DRR for resilience.* Prioritise "grey-green" infrastructure, champion the More Room for River project, and strengthen critical infrastructure such as schools and hospitals against climate risks.

- *Enhancing community-based preparedness.* Institutionalise the training of volunteer forces and further empower LSGs with financial and technical resources to act as the first line of defence.

By placing its people, especially the most vulnerable, at the centre of its strategy and championing adaptation as a core principle, Kerala has raised the bar for disaster governance in India. Despite the uncertainties of climate change, the State's demonstrated capacity for innovation, learning, and collective action provides a strong foundation to meet future challenges.

Waste Management

Kerala has made significant strides in waste management between 2016-17 and 2025-26, a period marked by the establishment of a series of missions and programmes aimed at addressing long-standing gaps in the sector. The Government prioritised waste management as a key objective of the Haritha Keralam Mission, launched in 2016. This was followed by dedicated initiatives to strengthen waste management systems in rural and urban Kerala. These efforts culminated in a State-wide drive to clean Kerala up by mobilising all available funding sources and keeping Local Self-Governments (LSGs) at the forefront of implementation. Key features of the reforms are the establishment of decentralised waste collection through a network of processing facilities, strict enforcement of waste management regulations, and sustained public awareness efforts.

Before 2015, Kerala faced significant challenges in its waste management system, including critical infrastructure deficits, unscientific and centralised dumping, and widespread civic unrest stemming from environmental and public health concerns near landfill sites such as Vilappilsala, Lalur, and Njeliyanparambu. Coupled with the operational inefficiencies of these facilities, this demonstrated that a centralised model is neither sustainable nor suitable for the State, and there was a need to strengthen LSGs to perform the mandatory function of waste management more effectively. The 13th and 14th Five-Year Plans identified that LSGs, both urban and rural, have a significant task ahead in waste management.

Kerala generates more than 10,000 tonnes of solid waste daily, according to the Suchitwa Mission, with organic waste accounting for nearly 75 per cent. It is a mandate of LSGs to manage waste within their jurisdictions, and serve as the primary implementing

Table 20.4 *Year-wise expenditure by major stakeholders in sanitation and waste management* in Rs lakh

Year	Suchitwa Keralam (Rural and Urban)	SBM (Urban)	SBM (Rural)	KSWMP (component 1,2 and 3)	KSIDC	LSGs	Total
2016-17*	2,668.5	-	15,846	-	-	35,371.6	53,886.3
2017-18#	2,251.9	307.1	14,079	-	-	24,641.1	41,279
2018-19	2,797.7	4,385	3,145.2	-	-	25,603.2	35,931.1
2019-20**	578.3	1,354.8	1,551.4	-	-	20,072.7	23,557.2
2020-21	3,932.5	3,349.3	825.5	-	-	57,669	65,776.3
2021-22	3,564.6	-	1,625.9	-	-	63,535.1	68,725.6
2022-23	1,916.8	940	2,829	1,203.6	-	72,592.4	79,481.7
2023-24	1,711.1	8,280.8	6,046	4,791.1	-	65,436	86,265
2024-25	1,955.2	6,817.7	6,360.5	4,968.3	65	88,541.4	1,08,708
2025-26 (up to October)	185.4	2,073.6	481.6	3,110.6	-	-	5,851.2
Total	21,561.9	27,508	52,790	14,073.5	65	4,53,462.4	5,69,461.3

Source: Budget documents

*Notes:** Apart from Suchitwa Keralam Urban and Rural schemes, viz, setting up of slaughter houses, burial grounds, and the Community development sub sector) and programme in urban areas, the Value Addition Scheme is included.

Apart from SK Urban and Rural, Integrated low-cost sanitation is included.

**Apart from SK Urban and Rural outlay, the Solid Waste Management Fund (Urban) is included.

agencies for waste management. The Suchitwa Mission, functioning as the State's technical arm, plays a central role in policy development, capacity building, and providing technical support for both solid and liquid waste management.

Waste management has been systematically integrated into the development plans of Local Self Governments. LSGs are empowered to formulate local-level waste management projects with technical and institutional support from the Suchitwa Mission. These projects can be integrated with the schemes implemented by the Suchitwa Mission, which oversees the major State-sponsored programme, Suchitwa Keralam (Rural and Urban), as well as Centrally Sponsored Schemes (CSS), including the Swachh Bharat Mission (Grameen and Urban). Other major interventions in this sector include the Kerala Solid Waste Management Project (KSWMP), an externally-aided initiative focused on solid waste management, and the waste-to-energy project implemented by the Kerala State Industrial Development Corporation (KSIDC). In addition to these flagship initiatives, several other sanitation and waste management schemes have been operationalised through various departments.

An analysis of year-wise allocations to, and expenditure by, major agencies in Kerala's sanitation and waste management sector indicates a steady increase in financial commitment over the past decade. Enhanced State outlays, along with the externally aided KSWMP from 2022–23 onwards, have substantially increased overall allocations, reflecting the Government's prioritisation of waste management. Allocations to LSGs have also risen consistently over the years. Overall, cumulative expenditure across all stakeholders amounted to Rs 5,694.6 crore during the period 2016-17 to 2024-2025, underscoring the growing emphasis placed by the State on sanitation and waste management.

The State has effectively evolved a decentralised management model for biodegradable waste, emphasising source-level composting at the household, institutional, and community levels. This approach, guided by the principle "My Waste, My Responsibility," has reduced dependency on centralised infrastructure and encouraged community participation in waste management, leading to significant progress in solid waste management during the last decade. Segregation at the source has emerged as a critical component of Kerala's waste management system, increasing the commitment among LSGs and communities to classify waste into organic and inorganic categories at the point of generation. A striking improvement is observed in source-level segregation, which increased from 47 per cent in 2023 to 94 per cent by 2025, indicating widespread behavioural change and effective enforcement mechanisms. Furthermore, inorganic waste is increasingly being separated into specific streams, such as plastic, leather, glass, electronic, electrical, and biomedical waste, which are collected door-to-door on designated calendar days and transported to authorised treatment facilities. The new system has been strengthened by the establishment of material collection facilities (MCFs), resource recovery facilities (RRFs), recycling plants, processing centres, and the enhancement of the Clean Kerala Company's activities, among other initiatives.

Waste Management Practices in Kerala

Solid waste management

The data on performance in solid waste management from 2016-17 to 2025-26 shows that total solid waste generation in Kerala rose gradually from 9,666 TPD

Table 20.5 *Solid waste management in Kerala, 2016-17 to 2025-26* in TPD and tonnes

Particulars	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Amount of Solid waste generated (TPD)	9,666.9	9,716.5	9,766.6	9,817.1	9,868.1	9,919.4	9,971.2	10,023.5	10,076.2	10,129.3
Amount of Solid waste processed (TPD)	7,350.0	8,040.0	8,575.0	9,150.0	9,600.0	9,722.0	9,893.0	9,853.0	9,868.8	10,072.0
Collected plastic waste handed over for recy-cling (in tonnes)	740.0	850.0	920.0	940.0	950.0	980.0	1,060.0	1,069.0	1,071.0	1,072.0

Source: Suchitwa Mission, Government of Kerala

to 10,129 TPD. However, the solid waste processed increased faster than generation — from 7,350 TPD in 2016-17 to 10,072 TPD in 2025-26 — a significant improvement in processing coverage and demonstrating enhanced infrastructural and operational capacities. Plastic waste recycling also showed a positive trend, with the quantity recovered increasing from 740 tonnes to 1,072 tonnes, indicating strengthened collection systems and improved connections with recycling industries.

Non-recyclable plastic waste is shredded and mixed with tar for roads. During 2016-2025, Clean Kerala Company Limited (CKCL) supplied 3,864.4 MT of shredded plastics to various agencies including the National Highway Authority of India (NHAI), Public Works Department (PWD), and LSGs. According to CKCL, the total length of polymerised road constructed during this period using shredded plastic was 6,663.9 km.

The Government of Kerala has also appointed CKCL to collect electronic waste generated (including IT and telecom equipment, consumer electrical and electronic products, and other items) in Government offices, institutions, public sector undertakings, and other entities, and dispose of it by handing it over to authorised e-waste collectors/recyclers. The quantity of e-waste collected in the State increased from 1,289.2 tonnes in 2019-20 to 6,023.5 tonnes in 2023-24, as per the annual reports of the Kerala State Pollution Control Board.

There has been a significant development of infrastructure for waste management at the community-level as well. Over 1,000 decentralised treatment facilities were made operational, complemented by large-scale composting and bio-CNG plants. Bulk waste generators such as hotels, markets, and institutions were mandated to treat their waste on-site using approved technology. Alongside these interventions, State-wide campaigns promoted plastic reduction and encouraged the adoption of reuse practices, further reinforcing Kerala's commitment to sustainable waste management.

Liquid waste management

There has been a significant improvement in liquid waste management in Kerala over the past decade. The State established 32 Sewage Treatment Plants (STP) and seven Faecal Sludge Treatment Plants (FSTP), alongside initiatives for decentralised greywater recycling and localised sewerage systems. Mobile treatment units were introduced to strengthen on-site treatment capacity in rural and semi-urban areas. These efforts complemented Kerala's emphasis on integrated sanitation systems and strengthened public health safeguards. A significant development is that the Muttathara sewage treatment plant in Thiruvananthapuram has been upgraded to handle the sludge generated by the installation of an Omni Processor (OP) system- an innovative, decentralised, thermal waste-processing technology. The new treatment facility enables the reuse of treated water for construction, industrial use, and other purposes, supporting water conservation and reducing pollution. In Cherthala, Alappuzha District, a state-of-the-art FSTP was built as part of the Rebuild Kerala Initiative.

Another key innovation has been the deployment of Mobile Septage Treatment Units (MSTU) in areas where large treatment plants are not feasible due to space constraints or public concerns. These units, mounted on vehicles, directly collect and treat septic waste, thereby lowering health risks and safeguarding the environment. Currently, these units are operational in the Municipalities of Changanassery, Kodungallur, Chalakudy, Chavakkad, Kunnamkulam, Alappuzha, and Manjeri. MSTUs offer a cost-effective, quick, and efficient solution, particularly suited for smaller towns that lack extensive infrastructure. Moreover, they enable the reuse of treated water for gardening or other non-potable applications.

Legacy waste remediation

The Government has successfully transformed several long-standing waste dumping sites, including Brahmapuram in Kochi, Lalur in Thrissur, Njeliyanparamba in Kozhikode, Kureepuzha Chandi Depot in Kollam, and Savakotta in Guruvayur, through systematic remediation efforts. Of the 59 identified dumpsites in Kerala, 24 have been fully cleared, and the corresponding land has been reclaimed. A landmark achievement was the clearance of nearly three-fourths of the Brahmapuram dumpsite, reclaiming over 18 acres of land for green development projects. These interventions highlight the State's commitment to addressing legacy waste while simultaneously planning for long-term sustainability. Non-recyclable reject waste is supplied to cement companies for use as fuel. To facilitate the disposal of reject waste, four machines are being installed- two in Kochi and two in Thiruvananthapuram, to convert it into Refused-Derived Fuel (RDF).

Malinyamuktham Navakeralam campaign for waste management

In 2017, the Haritha Keralam Mission was launched as part of the Navakeralam Karma Padhathi, with

sustainable and scientific waste management as one of its core objectives. Building on this foundation, the Navakeralam Vrithiyulla Keralam State Action Plan was rolled out in 2022, with the ambitious goal of making Kerala garbage- and litter-free by 2025. The plan brought together existing initiatives, such as the annual pre-monsoon cleaning drive, into a unified and intensified effort.

A major blaze that broke out at the Brahmapuram solid waste treatment plant near Kochi, Kerala, in March 2023, fuelled by vast amounts of accumulated, unsegregated legacy waste, led the Government to evolve a concrete and time-bound action plan to address such instances in the State. The Government used this opportunity to design and implement a comprehensive State-level campaign to bolster the existing waste management initiatives in the State. In response to this, the Malinyamuktham Navakeralam campaign was launched with an accelerated target date of March 2024.

The campaign was implemented in three phases: Phase I focused on 100 per cent source segregation of waste, complete door-to-door collection of non-biodegradable waste, scientific processing of biodegradable waste, ensuring hygiene in public spaces, clearing garbage dumps and cleaning and restoring water bodies; Phase II concentrated on developing essential infrastructure and systems to manage the increased waste generated during Phase I, and institutionalising the improvements; Phase III aimed at sustaining progress and establishing robust systems for processing domestic hazardous waste, sanitary waste, and construction and demolition waste. Activities also included bioremediation of dumpsites and the scientific disposal of inert materials and rejects.

As stated earlier, a significant infrastructure network for waste segregation and collection has been established across all Panchayats, Municipalities, and Municipal Corporations of the State. As on October 2025, this included 20,051 mini-Material Collection Facilities (mini-MCFs), 1,350 MCFs, and 205 Resource Recovery Facilities (RRFs). Additional projects to expand this infrastructure are currently being implemented by LSGs. State and District-level technical committees have been formed to expedite the approval process for these projects. Haritha Karma Senas (HKS), Kudumbashree's micro-enterprises, are at the forefront of waste collection by transporting sorted waste to MCFs, where further segregation occurs, and recyclable materials are processed at RRFs. Plastic waste is recycled, sent to cement kilns or energy plants, or repurposed for road construction. LSGs have also been directed to use shredded plastic in local road works.

Haritha Karma Sena

In 2017, as part of the Haritha Keralam Mission Project implemented by the Government of Kerala, the Haritha Karma Senas were constituted. The door-to-door collection of inorganic waste, and in some instances, organic waste, by members of Haritha Karma Sena is carried out from households and institutions. The number of Haritha Karma Senas has expanded from 5,000 in 2017 to 37,765 by 2025. Households pay a monthly user fee of Rs 50 in rural areas and Rs 100 in urban areas, while commercial establishments are charged based on the volume of waste they generate. This user fee is the primary source of income for the workers, who earn an average monthly wage of about Rs 12,000. Harithamitram, a mobile app, was created to streamline the operations of Haritha Karma Sena. The new version, Harithamitram 2.0, launched on August 17, 2025, introduced an important feature, digital payments, enabling households and institutions to pay monthly service charges via UPI. The Chief Minister's e-Governance Award was conferred for the Harithamitra 2.0 application. It is noteworthy that the number of households utilising the Harithamitra application has increased significantly, from 11.2 lakh to 90 lakh. During the 2024-25 financial year alone, the Harithakarma Sena collected over 1.5 crore tonnes of inorganic waste. Without this system, much of the waste would have been burned or dumped indiscriminately.

Other initiatives

A series of innovative initiatives in waste management marked the 13th and 14th Plan periods. Kerala developed specialised systems for processing poultry, piggery, fish waste, and hair waste, and implemented an e-waste recycling policy in partnership with authorised agencies. A construction and demolition waste processing plant was started in a public–private partnership (PPP) model in Ernakulam-Idayar, reflecting the expansion of Kerala's waste governance beyond conventional streams. A network of chicken rendering plants under PPP models provided a scalable solution to manage organic waste generated from the poultry sector.

There has been relentless insistence on observing green protocol in all major Government events, as well as numerous private events, festivals, sports fairs, and weddings. The basic principle of the Green Protocol is to eliminate the use of disposable items, promote the use of washable utensils, and convert organic waste

Table 20.6 *District-wise details of Haritha Karma Sena (HKS) functioning in LSGs October 2025*

Districts	Gram Panchayats		Municipalities		Corporations	
	Total no. of Grama Panchayats	Number of Haritha Karma Sena functioning in GramaPanchayats	Total no. of Municipalities	No. of Haritha Karma Sena functioning in Municipal-ities	Total no. of Corporations	No. of Haritha Karma Sena functioning in Corporations
Thiruvananthapuram	73	2,549	4	234	1	1,180
Kollam	68	2,436	4	286	1	291
Pathanamthitta	53	1,117	4	58	0	0
Alappuzha	72	2,162	6	368	0	0
Kottayam	71	1,977	6	258	0	0
Idukki	52	1,528	2	135	0	0
Ernakulam	82	3,835	13	558	1	834
Thrissur	86	2,330	7	393	1	270
Palakkad	88	2,522	7	443	0	0
Malappuram	94	2,815	12	470	0	0
Kozhikode	70	2,894	7	186	1	709
Wayanad	23	775	3	167	0	0
Kannur	71	1,906	9	326	1	110
Kasargod	38	1,458	3	185	0	0
Total	941	30,304	87	4,067	6	3,394

Source: Suchitwa Mission, Government of Kerala

generated into fertiliser through composting at the respective locations to reduce waste. The swap shop concept, adopted and implemented by the Suchitwa Mission, has helped to promote recycling opportunities. Through this concept, individuals exchange used items for someone else's use, rather than throwing them away after their own needs are met.

For the scientific management of sanitary waste, 4,740 institutional-level sanitary incinerators have been installed across the State. Following an assessment indicating the need for additional District-level facilities, LSGs have been directed to establish at least two incinerators in each District. In addition, four community-level sanitary waste incineration plants have been commissioned, and more than 40 LSGs have initiated preliminary steps to establish similar facilities.

The achievements indicate a consistent strengthe ning of Kerala's waste management system, characterised by improvements in household participation, processing efficiency and plastic recovery.

To enhance the sustainability and accountability of waste management, the Government has made user fee payments mandatory, enabling LSGs to increase coverage among households and commercial establishments significantly. To ensure 100 per cent scientific processing of biodegradable waste at the source, both individual and community-level composting solutions have been promoted.

To maintain clean public spaces, Garbage Vulnerable Points (GVPs) have been geo-tagged, cleared, and are monitored to prevent re-accumulation. A new policy aligned with the Construction and Demolition Waste Rules, 2016, has been introduced, prompting LSGs to

establish dedicated construction and demolition waste collection centres. The Kerala Solid Waste Management Project (KSWMP) has also identified suitable sites for construction and demolition storage facilities across the State. Model plastic waste management by-laws have been issued to guide LSGs, and legal reforms—namely, the Kerala Panchayat Raj (Amendment) Ordinance, 2023 and the Kerala Municipality (Amendment) Ordinance, 2023—have been enacted to strengthen their waste management authority. The Green Enterprises initiative aims to boost entrepreneurship and investment in the waste management sector by creating a collaborative ecosystem involving Government departments, institutions, and agencies to support innovative ventures.

Waste management innovations initiated during this period also included the Suchitwa Sagaram programme, which motivates fishermen to collect ocean plastic, and the implementation of formal e-waste collection schemes in cities like Kochi and Maradu. Legal reforms are also progressing to address the issue of cross-border waste dumping. The campaign promotes regulatory compliance, encourages the replacement of single-use plastics with eco-friendly options, and aims to change behaviour through awareness and community engagement. Enforcement efforts have intensified, with the number of inspections rising from 1,138 in 2023 to 90,438 in 2025 and fines increasing sharply from Rs 2.5 lakh to Rs 855 lakh in the first half of 2025. Moreover, the installation of 5,410 CCTV camera monitoring points has further improved compliance and accountability in waste management.

Accomplishments in the Implementation of State and Centrally Sponsored Schemes

In the backdrop of the emphasis on waste management, the implementation of development schemes in this sector also gathered unprecedented momentum. Among the State-sponsored schemes, Suchitwa Keralam Rural and Urban schemes involved awareness campaigns to promote scientific waste management practices through audio-visual and print media. This scheme also included installing mini, medium, and significant bio-waste treatment systems at the household, institutional, and community levels to serve the waste management needs of families and institutions in the State. Under the Suchitwa Keralam scheme, various components included liquid waste management, information, education, and communication (IEC) activities, Take

Table 20.7 *District-wise details of ODF Plus, solid, and liquid waste management in Villages, November 2025*

District	Villages			
	No of Villages	No of Villages with SWM facilities	No of Villages with LWM facilities	No of Villages that are ODF Plus
Alappuzha	83	77	77	77
Ernakulam	103	93	93	93
Idukki	68	66	65	66
Kannur	105	102	102	102
Kasaragod	119	116	116	116
Kollam	91	91	91	91
Kottayam	91	87	87	87
Kozhikode	92	84	84	84
Malappuram	116	112	109	112
Palakkad	148	144	144	144
Pathanamthitta	65	63	63	63
Thiruvananthapuram	94	93	93	93
Thrissur	214	208	208	208
Wayanad	46	45	45	45
TOTAL	1,435	1,381	1,377	1,381

Source: SBM Grameen Dashboard

a Break toilets on the sides of the road and in public places, pre-monsoon cleaning, public toilets, septic tanks, sanitary napkin destroyers, and source-level waste treatment.

The centrally sponsored programmes in waste management are implemented with a 40 per cent share of the outlay met by the State Government. Among the centrally funded schemes, the Swachh Bharat Mission (Grameen) Phase II focused on Open Defecation Free (ODF) status and enhancing solid and liquid waste management. As of November 23, 2025, the State had constructed a total of 2,72,315 individual household latrines (IHHLs) under this scheme, according to the SBM Grameen dashboard.

Gram Panchayats have almost entirely met the criteria to achieve ODF Plus status by fulfilling the standards set by the Department of Drinking Water and Sanitation, Government of India. The requirements stipulate that all residents should have access to toilets, proper toilet usage, scientific management of solid and liquid waste, and public sanitation facilities. Gram Panchayats can achieve ODF Plus status only if liquid waste is managed effectively. As of November 23, 2025, 1,381 SBM villages have solid waste management facilities, and 1,377 villages have facilities for managing liquid waste. Currently, out of 1,435 SBM villages, 1,381 are in ODF plus status, and 1,372 come under the model category. Details of the ODF Plus status in the State are depicted in Table 20.7.

Furthermore, according to data from the SBM Grameen dashboard, as of November 23, 2025, the State has constructed 2,076 Community Sanitary Complexes, meeting the requirement of having at least one community sanitary complex outlined in SBM (G).

Regarding the Swachh Bharat Mission (Urban), components such as construction of individual household latrines, public toilets, solid waste management, capacity building, and information, education, and communication activities, stipulated in the guidelines, have been complied with.

As of October 2025, as part of SBM (U), 9 lakh tonnes of legacy waste have been remediated out of a total of 13 lakh tonnes, and 78 acres of land have been reclaimed. The State has initiated six bio-methanation plants and 49 waste-to-compost plants. As part of SBM Urban, 1,169 community and public toilets have been constructed.

In terms of **s**olid waste management, the proportion of waste processed improved significantly from 2016 to 2025. Processing efficiency rose from just 52 per cent in 2017 to nearly 100 per cent in 2025-26. The most notable achievement occurred in 2024, when Kerala reached 100 per cent processing of urban solid waste, signalling full compliance with scientific waste management protocols and a substantial strengthening of urban waste-processing capacity.

Kerala Solid Waste Management Project (KSWMP). Further strengthening this framework, the Kerala Solid Waste Management Project (KSWMP), jointly funded by the World Bank (International Bank for Reconstruction and Development, IBRD), the Asian Infrastructure Investment Bank, and the Government of Kerala, began operations in January 2022. With a project cost of USD 300 million (approximately Rs 2,400 crore), KSWMP aims to enhance the entire solid waste management value chain through technical assistance and capacity-building interventions. These efforts are targeted at urban LSGs and regional levels using an integrated service delivery value chain approach.

Swachh Survekshan. As a result of sustained efforts in sanitation and solid waste management, Kerala has attained a remarkable milestone in the National Swachh Survekshan rankings in 2024-25. All 94 urban LSGs in Kerala have achieved Open Defecation-Free (ODF) status, and 77 are ODF Plus, three are ODF Plus Plus, and Thiruvananthapuram has achieved the highest ranking of Water Plus. Twenty urban LSGs have won one star on the Garbage-Free City (GFC) ranking,

Box 20.1
Vruthi 2025 - Clean Kerala Conclave

Vruthi Conclave marked a major milestone in public engagement. The five-day Conclave showcased technological innovations such as smart bins, AI-driven waste solutions, and decentralised biogas systems, while also facilitating youth participation through hackathons and outreach programmes. Business sessions mobilised more than Rs 3,000 crore in confirmed investments for waste management infrastructure. The Conclave also emphasised the circular economy, highlighting the role of green entrepreneurship and extended producer responsibility in sustaining reforms.

while three –Alappuzha, Shoranur, and Pattambi–are now three-star. Eight urban LSGs in Kerala are among the top 100 cleanest cities in India, and 82 out of 94 are in the top 1000. This is a substantial improvement over the previous Swachh Survekshan, when no urban LSG from Kerala was ranked in the top 1,000. Additionally, the Mattannur Municipality received a Ministerial Award in the Special Category highlighting its exemplary performance.

Way Forward

Kerala must now consolidate the achievements and attempt a transition from the phase of accelerated problem-solving to one of long-term sustainability, technological integration, and universal compliance. This should be achieved by deepening decentralisation, strengthening institutional capacities, and adopting innovative solutions to ensure that the current accomplishments—such as near-universal source-level composting, high rates of waste processing, and the extensive network of MCFs, RRFs, and Haritha Karma Senas—are not only maintained, but also expanded to cover emerging challenges.

Kerala should further refine its decentralised solid waste management system by providing uninterrupted service delivery across all LSGs, by calibration of infrastructure utilisation, optimisation of collection frequency, and improved monitoring through digital tools. The Harithamitram platform can evolve into a real-time governance dashboard that integrates data on segregation compliance, processing performance, plastic recovery, and user-fee collection, leading to evidence-based interventions to improve waste management in low-performing Panchayats and Municipalities. Strengthening enforcement mechanisms is necessary to address gaps in compliance among bulk waste generators and institutional establishments, where mandatory on-site treatment should become a universal requirement.

Achieving a clean and garbage-free Kerala also requires expanding the capacity of recycling and resource recovery systems. In addition to the existing networks of MCFs and RRFs,advanced materials recovery and decentralised micro-recycling enterprises must be promoted. Further, Extended Producer Responsibility systems must be integrated into local governance. These measures can shift Kerala toward a circular economy. Ensuring stable off take markets for compost, biogas and RDF will also be critical for sustaining these facilities.

The State should aim to strengthen its liquid waste infrastructure. The foundations created through sewage treatment plants, faecal sludge treatment plants, mobile septage treatment units,and greywater recycling initiatives must be expanded into a State-wide system. A comprehensive liquid waste strategy for 2030 should integrate urban and rural sanitation, ensure continuous operation of STPs, strengthen desludging services, and mandate periodic septic tank maintenance. Protecting water bodies will be central to this strategy, which will demand strict enforcement against illegal discharges, the large-scale revival of canals and wetlands, and community monitoring supported by technology-based water quality assessment tools. The state should encourage the utilisation of treated wastewater in construction, landscaping and industrial applications.

There should also be consistent efforts to remediate the remaining legacy waste sites and convert them into green zones and utilitarian public spaces, reinforcing public confidence in scientific waste management. Techniques such as biomining, bio-capping, and environmentally safe disposal of rejects through cement industries and RDF plants should be scaled up.

Creating awareness among people and promoting behavioural transformation should continue without pause. Public participation must be deepened through continuous awareness campaigns, school-based programmes, and community-led monitoring. Further, the Green Protocol should evolve into a societal norm for households, institutions and commercial establishments. The principles of reduction, reuse and responsible consumption must be integrated into the day-to-day activities of institutions and households. Initiatives such as swap shops, fishermen-led ocean cleanups, massive participatory garbage clearance at public and tourist sites, banning plastic at ecologically fragile zones, and green entrepreneurship platforms require further expansion to embed sustainability in everyday practice.

Kerala must position itself as a global leader in climate-resilient and technologically driven waste management. Robotics, IoT-based waste tracking, artificial intelligence for route optimisation, and decentralised bio-digesters can significantly improve efficiency and safety. The State must adopt a future-ready approach that integrates climate adaptation, circular economy principles, and inclusive governance. With an unwavering commitment of the kind witnessed in the past decade, Kerala can transform its waste management reforms into a model of ecological stewardship, public health protection, and resilient development for the world.

Chapter 21
Transport for Modern Economy and Sustainable Growth

The Government of Kerala's initiatives in the transport sector are designed to improve social and economic well-being by ensuring a fast, safe, affordable, and environmentally responsible transport system in the State. The 13th and 14th Five-Year Plans focused on the development of a multimodal transport system to enhance the share of public transportation for passengers and freight movement, and strengthening the physical road infrastructure.

The conversion of major National Highways into four-lane roads in this period has been remarkable. Kerala's decision to share 25 per cent of land acquisition costs for National Highways with the Union Government, and the off-budget borrowing through KIIFB for infrastructure development have been key to the rapid improvements. Around 45 per cent of the KIIFB funding was deployed in roads.

The Government of Kerala has pushed for 100 per cent all-weather road connectivity to all villages and strengthened key east-west corridors to address last-mile connectivity issues. Major projects including the Hill Highway and Coastal Highway were initiated. Road safety was elevated to a major public health priority, tackled through institutional strengthening of the Kerala Road Safety Authority, and initiatives such as Mission Zero. The development of climate-resilient infrastructure under the Rebuild Kerala Initiative focussed on strengthening roads and bridges to withstand natural disasters.

The State Government is committed to improving the quality of the public transportation system, modernising existing infrastructure, enhancing road safety measures and pursuing sustainable greener transport options (including the promotion of Electric Vehicles (EVs). The revival of the Kerala State Road Transport Corporation (KSRTC) services post-Covid through systematic fleet augmentation, IT-enabled route optimisation and cost reduction, reduction of off-road buses, modernisation of workshops to shorten repair turnaround time, and improvements in passenger convenience at depots and during travel, has resulted in increased bus usage and revenue.

The Government operationalised the Kochi Metro and Kochi Water Metro (the first of its kind in the country) with emphasis on multi-modal integration to provide last-mile connectivity. Initiatives include improving inland water transport by developing the West Coast Canal and its feeder routes. The operationalisation of Kannur International Airport has enhanced regional air connectivity. A major achievement was the construction of the Vizhinjam International Seaport, a deep-water container transhipment terminal. This project is expected to be a significant source of economic activity in the State. Concurrently, the Government adopted a more systematic approach to the development of minor ports, focusing on upgrading their infrastructure and promoting coastal shipping as a viable alternative to road transport.

Transportation is a decisive factor of economic infrastructure, and one that enhances the impact of the resources deployed in the productive sectors. It facilitates everyday commuting to work, trade, tourism, and the economic rebalancing of uneven regional growth. Transportation systems in their entirety should be responsive to people's needs and convenience, and to cost considerations. The speed and reliability of mobility are thus foundational features of modern economic life.

Road Infrastructure

Kerala has achieved remarkable progress in roads and bridges infrastructure. Roads are the primary mode of transport in the State. The length of road per 1,000 population in Kerala is 5.3 km against the all-India average of 4.5 km. The road length per 1,000 sq km in Kerala is around 4,992 km compared to all India average of 1,916 km. The number of vehicles per-thousand population in Kerala is 485 (2024). Kerala's high road density is fuelled by a high density of population and unique geographical conditions which necessitate a higher dependence on roads for the transportation. Kerala's road infrastructure is developed by all three tiers of the Government. Details on the length of roads maintained and developed by various agencies in Kerala, are provided in Table 21.1.

The State Public Works Department has separate departments for roads, national highways and bridges. The Public Works Department (PWD) develops and maintains 15 per cent of the total road length in the State. The National Highways (NH) in the State carry 40 per cent of the total road traffic, while the State Highways and Major District Roads (MDRs) carry another 40 per cent of the road traffic. Currently, 12 National Highways are running through Kerala, totalling 1,858 km in length as of 2025. Out of this, the NH wing of the State PWD maintains 548 km,

Table 21.1 *Agency-wise details of roads developed and maintained in the State, March 2025* in km

Sl. No.	Department	Road length in km and share in total
1	Local Self-Governments (LSGs)	1,58,078.8 km (80.1per cent of the total)
2	National Highways (NH)	1,858 km (around 1 per cent of the total)
3	Public Works Department (PWD)	29,573 km (15 per cent of the total)
3.i	State Highways (SHs)	4,128 (14 per cent PWD roads) [898 km four-lane, 3,193 km two-lane, 37 km single-lane]
3.ii	Major District Roads (MDRs)	25,445 (86 per cent of PWD Roads) [52 km four-lane, 10,593 km two-lane, 14,800 km single-lane]
4	Forest Department	5,189.4 (2.6 per cent of the total)
5	Others roads*	2,749 (1.4 per cent of the total)
	Total Road Length	1,97,448.3 km

Source: Public Works Department, Forest Department, and Local Self-Government Departments, Government of Kerala
Note: * Other roads are constructed and maintained by Railways, Irrigation, Kerala State Electricity Board, and Devaswom Department.

and the remaining 1,310 km are under the maintenance of the National Highway Authority of India (NHAI) under the Ministry of Road Transport and Highways (MoRTH), Government of India.

The Public Works Department (Bridges) wing in Kerala focuses on critical infrastructure development, with special attention to enhance tourism and tribal connectivity by constructing bridges in tourist destinations and in remote and hilly terrains. In 2016, the PWD's road network included 1,806 bridges. As on March 31, 2025, there are a total of 2,849 bridges in the State (550 bridges on State Highways, 2,145 bridges on Major District Roads and 154 bridges on Other District Roads, Village Roads, and Railway Over Bridges).

Road infrastructure in the 13th and 14th Five-Year Plans

Kerala's Five-Year Plans have consistently prioritised the development of its road infrastructure sector, recognising its role in the State's socio-economic progress.

The 13th Five-Year Plan aimed to create a safe, efficient, sustainable, and environmentally friendly transportation system, with a strong focus on overhauling and expanding the State's road network. The Plan prioritised modernising infrastructure, improving road quality, enhancing road safety, integrating multimodal transport, and adopting new management and development strategies.

The central thrust of the Plan was capacity augmentation and upgradation, particularly the transition from single-lane roads to higher-capacity corridors. Targets included increasing the share of four-lane National Highways and urban roads from 0.48 per cent to 1.37 per cent, widening two-lane and intermediate roads, and implementing major initiatives such as the Coastal Highway and Hill Highway projects. To ease congestion in urban areas, the Plan emphasised the construction of flyovers, bypasses, and access-controlled highways.

The Plan also prioritised upgrading all Public Works Department (PWD) roads to a minimum two-lane standard, supported by innovative land pooling mechanisms and fair compensation policies to address land constraints. A systematic Road Maintenance Management model was introduced, based on outsourcing, a digital road asset database, long-term Public–Private Partnership (PPP) maintenance contracts, and the use of durable materials. Further, the Plan sought to strengthen the ecosystem of consultants and contractors, promote PPP models such as Design–Build–Finance–Operate–Maintain–Transfer (DBFOMT), and encourage the adoption of advanced construction machinery. To improve monitoring and quality assurance, the establishment of a State-level regulatory body and District coordination committees was proposed, along with the adoption of international best practices such as International Road Assessment Programme (iRAP) ratings, road safety audits, and traffic impact studies.

Building on the objectives of the 13th Five-Year Plan, the 14th Five-Year Plan provided additional impetus to strengthening transport networks, improving rural connectivity, optimising logistics, reducing travel time and accidents, promoting green mobility, and advancing integrated transport management.

The Plan places emphasis on the development of resilient road infrastructure, sustainable urban mobility, and smart traffic management systems, supported by integrated transport technologies. It promotes the adoption of modern and environmentally friendly vehicles, strengthens public road transport—particularly the Kerala State Road Transport Corporation (KSRTC)—and aims to reduce logistics costs. A people-centric approach underpins the Plan, with a focus on inclusive growth, improved mobility, and enhanced living standards across the State.

Between 2016-17 and 2024-25, the Government of Kerala has spent Rs 24,577 crore on Roads and Bridges and Rs 11,730 crore on Road Transport.

Major initiatives of the Public Works Department

The Public Works Department has structured its initiatives into two key areas: Improving efficiency; and improving safety. (Table 21.2)

Achievements of the Public Works Department

Roads. Between 2016 and 2025, a total of 11,666 km of Public Works Department (PWD) roads were upgraded to Blacktop Macadam (BM) and Bituminous Concrete (BC) standards. In this period, 3,061.8 km of roads were constructed using plastic, 4,759 km using natural rubber, and 138.6 km using geotextiles. Modern technologies such as Cold in-place recycling (CIR) (milling) and soil stabilisation methods was used in the completion of 107.7 km of road. White topping technology was used in the City Road Improvement Project in Alappuzha District.

National Highways. The widening of seven stretches of NH 66 work has been completed. Nileshwaram railway overbridge, Thalassery-Mahe Bypass, and Kazhakkoottam flyover have been completed. The Thiruvananthapuram-Karodu bypass up to the Tamil Nadu border has been opened to traffic. Approval has been granted for the Thiruvananthapuram-Vizhinjam-Parippally Outer Ring Road. The Kuthiran twin tunnels have been opened for traffic. Land acquisition is progressing for both Kozhikode-Malappuram-Palakkad National Highway 966 and the Kozhikode-Palakkad Greenfield Highway.

Bridges. Seven Railway Over bridges have been completed under projects implemented by the Roads and Bridges Development Corporation of Kerala Limited and financed through the KIIFB. The

Table 21.2 *Major initiatives of Public Works Department, 2016-2025*

Category	Roads	National Highways	Bridges
Improving Efficiency	• Scientific, need-based approach to road maintenance and strengthening of quality control mechanisms. • Digitalisation and IT integration measures for enhanced road management. • KIIFB-funded sustainable infrastructure through the improvement of road projects for enhancing connectivity across Kerala. • Better resource management	• Highway widening and upgradation projects to enhance traffic flow and connectivity. • Modern construction techniques, team coordination, and robust quality control mechanisms actively encouraged and implemented to ensure efficient project completion with high standards. • Digitalisation to improve efficiency in traffic management and bidding processes. • Investment in infrastructure to boost the State's overall connectivity.	• Modernising bridge design and construction through new technology, improved quality control, and significant projects to enhance connectivity and safety. • Efficient project management and regular inspections for effective bridge management.

Category	Roads	National Highways	Bridges
Improving Safety	• Black spot improvement and safer road design to enhance road safety. • Intelligent Transport Systems to improve traffic management and enforcement using technology to streamline operations and ensure compliance. • Promoting road safety through public campaigns and education. • Improved trauma care facilities and public assistance enhance emergency response. • Implementation of the Highway Protection Act.	• Road Safety Master Plan "Global Plan for 2nd Decade of Action for Road Safety 2021-2030" aimed at 50 per cent fewer fatalities and zero accidents by 2030. • Hazardous locations on roads systematically identified through data analysis of accidents and their improvement. • Road infrastructure design is reviewed and updated to align with international safety standards. • Corrective actions (expert reviews, contractor blacklisting, and new guidelines) to address and prevent construction flaws in projects like NH-66 in Kerala	• Bridge construction prioritising structural integrity and durability through the adoption of modern technologies, rigorous quality control, and adherence to international design standards to ensure long-lasting and safe infrastructure. • Systematic inspections, maintenance, and modern designs with enhanced safety features to ensure bridge lifespan, and load capacity assessments to optimise traffic management on Kerala's roads. • The Level Cross-Free Kerala initiative to construct railway overbridges and enhance the State's barrier-free road network.

Department has also introduced innovative initiatives including converting out-dated bridges into rest areas and tourist attractions, and constructing illuminating bridges of international standard across Kerala.

Other agencies associated with the improvements of roads in Kerala

Kerala Highway Research Institute (KHRI). KHRI is a research institute under the Kerala PWD (established in 1972). It promotes applied research, innovative technologies, and improved construction quality and material testing. In June 2020, KHRI was elevated to a Centre of Excellence. It focuses on areas such as design innovation, road asset and safety management, quality assurance, contract management, and indigenous research and development. The National Accreditation Board for Testing and Calibration accredited KHRI in February 2021. It has also collaborated with other research institutions and provides consultancy services to various engineering departments and agencies in the State.

Kerala State Transport Project (KSTP). The Kerala State Transport Project (KSTP) is a Government of Kerala initiative (established in 1996) supported by the World Bank. It aims to improve transport infrastructure, traffic flow, and road safety. KSTP-II is a Rs 2,403 crore (USD 445 million) project, which is jointly funded by the World Bank (56 per cent) and the State government (44 per cent). The Challenge Fund Programme is an initiative under the KSTP-II which promotes local partnerships to develop five new safe corridors/zones with the Kerala Road Safety Authority (KRSA), Public Works Department (PWD), and KSTP. The major achievements include upgraded State highways, integration with urban mobility projects like Kochi Metro's water transport, and extensive highway development by 2025 to improve overall connectivity.

Kerala Road Fund Board (KRFB). The Kerala Road Fund Board (KRFB) is a statutory body (established in 2001) which develops and maintains Kerala's transport infrastructure. The major projects of KRFB include road improvements in Thiruvananthapuram (42 km), Kozhikode (Phase I is 22.3 km at Rs 211 crore), and Kannur (44.1 km at Rs 401.5 crore which also includes land acquisition). The Kerala Road Fund Board (KRFB) implements city road projects through Public–Private Partnerships (PPP), using the Design–Build–Finance–Operate–Transfer (DBFOT) annuity model.

Roads and Bridges Development Corporation of Kerala Ltd (RBDCK). RBDCK was established on September 23, 1999, as a company under the State PWD. It handles major road infrastructure projects on a turnkey or Build–Operate–Transfer (BOT) basis. These projects are funded through market borrowing. As of 2025, RBDCK has completed 60 projects, including several Railway Overbridges (ROBs), bridges, flyovers, and roads, and also conducts GPS surveys and manage utility mapping.

Road Infrastructure Company Kerala Limited (RICK) The Road Infrastructure Company Kerala Ltd (RICK) established on March 19, 2012**,** is a company under the Kerala Road Fund Board. It develops and maintains State Highways and Major District Roads, mainly on a Design–Build–Finance–Manage–Transfer (DBFMT) basis. It focuses on key connectivity corridors, using annuity-based models to reduce congestion and improve safety, including projects like the proposed widening of the Karamana-Vellarada road.

National Transportation Planning and Research Centre (NATPAC). NATPAC was established 1976 and provides research-driven insights for transportation planning in Kerala, supporting policy decisions on traffic management, urban mobility, and road safety. NATPAC's important contributions include the mobility plans for Thiruvananthapuram and Kozhikode, road safety audits, studies on Intelligent Transportation Systems, studies on alternative pavements, studies on parking policies, studies on public transport (including Kochi Metro), studies on inland water transport, and studies on the impact of climate change.

Kerala Road Safety Authority (KRSA). KRSA was established in 2007, and ensures safer mobility by coordinating efforts across departments to reduce accidents and injuries. Its initiatives include black spot (a place where road traffic collisions have historically been concentrated) correction, public awareness campaigns, school-based road safety education, and technology-based enforcement through projects like Safe Kerala.

Kerala Infrastructure Investment Fund Board (KIIFB) projects

The Kerala Infrastructure Investment Fund Board (KIIFB) is an important source of funds for major infrastructure projects in the State. Table 21.3 summarises Public Works Department (PWD) projects funded by KIIFB. Out of the total 513 projects, 422 are

Table 21.3 *Public Works Department (PWD) projects funded by KIIFB, as of March 31, 2025*

Sl.No.	Sector	No. of Projects	Work Status	
			Completed	On-going
1	Roads	235	71	157
2	Bridges, Bridges and Fly over	108	18	88
3	Coastal Highway	40	1	39
4	Fly over and Under passes	9	2	6
5	Hill Highway	47	5	42
6	ROB	48	3	44
7	Junction Development	9	0	9
8	Tunnel	1	0	1
9	Bypasses	16	2	14
10	Others	6	2	4
	Total	513	91	422

Source: Kerala Infrastructure Investment Fund Board (KIIFB), GoK

ongoing and 91 have been completed. These include expansion of NH 66, the Hill Highway and the Coastal Highway.

Road Transport

Kerala's vehicle population witnessed significant growth between 2016 and 2025, influenced by a higher purchasing power, a growing preference for the use of personal transport and improved road infrastructure. The total number of registered vehicles in the State has increased significantly, reaching nearly 182 lakh in 2025-26 (As of March 2025), making Kerala one of India's most vehicle-dense States.

In this context, it is important to note that Kerala is leading in India's electric mobility transition through strong policy support, infrastructure development, and increasing consumer adoption. The number of Electric Vehicles (EVs) registered in the State has increased exponentially from 417 in 2019-20 to a cumulative 2.3 lakh by March 31, 2025. To promote e-mobility, the State offers incentives such as a 50 per cent road tax reduction for EVs and a Rs 30,000 subsidy for electric autorickshaws. The Motor Vehicles Department (MVD), Kerala State Electricity Board (KSEB), Agency for New and Renewable Energy Research and Technology (ANERT) and other private operators are actively expanding EV charging infrastructure. As of March 2025, KSEB operates 63 charging stations, and another 37 are under ANERT. There is also an increase in the number of homes that have availed EV charging options. With the shift to cleaner, cost-effective transport, there has been a sharp rise in the electricity usage.

Kerala State Road Transport Corporation

The Kerala State Road Transport Corporation (KSRTC) serves as a vital public transportation service in Kerala, operating over 5,000 buses across various routes and playing a crucial role in providing affordable, accessible connectivity especially for daily commuters and those in remote areas.

There has been a significant improvement in KSRTC's operational and financial performance over the last five years. While evaluating this performance, it is important to note that, unlike other southern States, Kerala's public road transport sector operates in an environment equally dominated by multiple private bus operators. Table 21.4 presents longer-term trends in average daily passengers, operating kilometres, and revenue from 2016 onwards.

The increased availability of cost-effective two- and three-wheeled vehicles has contributed to a decline in public road transport ridership across all Indian States, including Kerala. However, in recent years, this downward trend has stabilised, and ridership is now on an upward trajectory. From a low of 10.1 lakh passengers per day during the Covid period, average daily ridership has increased to 20.3 lakh by 2025 (Table 21.4).

The effective implementation of the KSRTC revival strategy has been the core factor behind this improvement. The strategy focused on the systematic induction of new fleet, the use of information technology for route optimisation and cost reduction, measures to reduce the number of "off-road" buses, modernisation of workshops to reduce turnaround time for repairs, and improvements in passenger convenience at bus depots and in the overall travel experience.

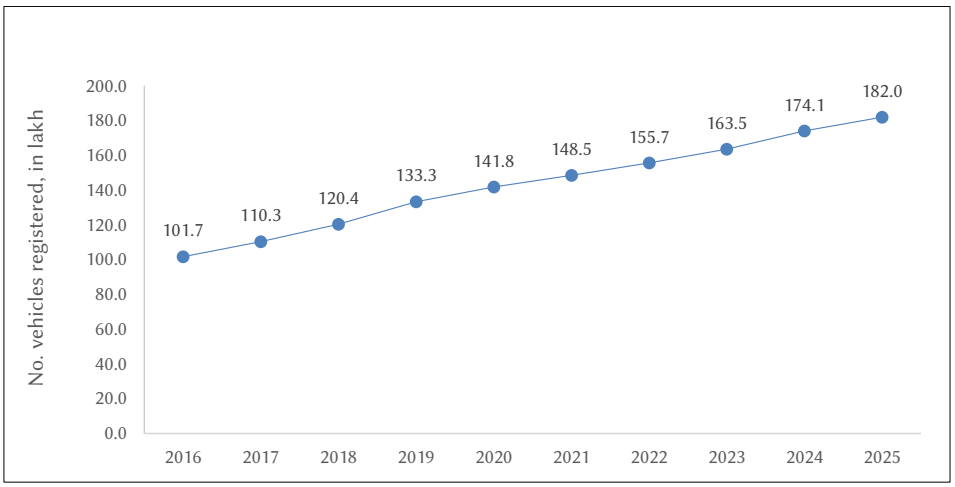


Figure 21.1 *Vehicle population in Kerala, 2016-2025* in lakh
Source: Motor Vehicle Department, Government of Kerala

Table 21.4 *Performance of KSRTC, 2016 to 2025*

Year	Average daily passengers (lakhs)	Average daily operating distance (km lakhs)	Average daily revenue (Rs lakhs)
2016	28.2	16.8	537.3
2017	28.8	17.4	585.1
2018	23.3	16.8	628.5
2019	26.6	16.3	626.6
2020	10.5	7.5	248.9
2021	10.1	7.9	287.4
2022	16.9	11.8	556.7
2023	19.4	13.9	669.1
2024	19.8	14.0	680.1
2025	20.3	13.9	706.0

Source: KSRTC

The goal is to transform KSRTC into a more efficient, financially viable, and environmentally-friendly public transportation system for Kerala.

Fleet augmentation. The size of the KSRTC's bus fleet has increased from 4,807 buses in 2017 to 5,056 in 2025. The fleet under KSRTC-Swift Limited expanded from 166 buses in 2023 to 462 buses by March 2025. This includes 50 electric buses procured in 2022–23 through KIIFB funding, and another 113 buses acquired under the Smart City Programme in 2023–24.

Overall financial performance. KSRTC's financial performance between 2015-16 and 2024-25 showed significant improvements across key indicators, including gross revenue, average earnings per vehicle, and average earnings per passenger per month. Gross revenue earnings increased from Rs 1,784.8 crore to Rs 2,540.4 crore, alongside stable gains in average earnings per kilometre and per vehicle per day. These trends reflect the success of targeted measures to enhance revenue generation and optimise returns from operational assets and ridership. Kerala Urban Road Transport Corporation (KURTC), another subsidiary of KSRTC, has also demonstrated growth, particularly in average daily earnings per km. KSRTC's consistent upward trajectory in measurement indicators suggests increasing efficiency in operations.

Operational efficiency and cost reduction measures. KSRTC has actively pursued various initiatives to enhance operational efficiency and achieve cost reduction through technology adoption. Key technological advancements include the introduction of Electronic Ticketing Machines for route rationalisation, the development of Near Field Communication (NFC)-enabled K-Wallet for seamless payments, and app-based passenger services. KSRTC is diversifying its services to boost revenue by introducing innovative city routes through Circular, Shuttle, and Radial services, and strengthening rural connectivity. KSRTC has also implemented measures for cost optimisation, including the My KMPL 5 campaign to promote fuel efficiency, improved fleet maintenance through refurbishment and optimised workshop scheduling. KSRTC has also worked to eliminate dead kilometres, optimising manpower, and empowering individual depots to become profitable units, demonstrating a comprehensive commitment to financial viability.

Measures to reduce the number of off-road buses. KSRTC is strategically addressing its off-road bus problem to enhance operational efficiency and financial stability. The Old to Gold initiative refurbishes older buses thereby extending their lifespan and improving fuel efficiency. Concurrently, KSRTC is strengthening the maintenance of its fleet by launching the Rapid Repair Teams (RRT) for on-the-spot fixes, enhancing centralised and depot workshops, and conducting periodic "super-checking" to prevent breakdowns. These efforts have already shown positive results, significantly reducing the number of off-road buses from 975 in November 2023 to 542 by August 2024, demonstrating improved fleet utilisation.

Modernisation of depots and measures to enhance performance. KSRTC's comprehensive depot modernisation plan aims to transform these facilities into efficient, revenue-generating centres. Key initiatives include upgrading workshops, implementing a "green makeover" for all 93 depots, waste management and enhanced sanitation measures, improving passenger amenities, utilisation of depots for various commercial strategies, establishing outlets for public fuel sales, computerisation of depots, and introduction of Android-based Smart Electronic Ticketing Machines (ETMs) and Passenger Information Systems for a more modern public transport system.

Tapping other sources of revenue. KSRTC is diversifying its revenue streams to achieve financial self-sufficiency through various measures such as advertising on buses and depots, naming rights for its facilities, commercial utilisation of its extensive real estate by leasing out spaces for shops, offices, and even converting old buses into Shops on Wheels. Additionally, KSRTC's logistics department provides parcel and cargo services and Yatra Fuels outlets generate revenue from public fuel sales. The corporation also generates income through budget tourism packages, charter services, scrap sales and also from the several driving training centres established across the State.

Other achievements. KSRTC has made significant strides in service diversification, technological integration, and infrastructure development between 2016 and 2025. The Corporation expanded their offerings to include premium interstate services like Garuda Maharaja and Gajaraj buses, Minnal night services, and specialised services to Sabarimala. KSRTC has also innovated with City Services featuring single-fare ticketing and Google Maps integration, successfully boosting passenger numbers. Grama Vandi services were introduced for rural connectivity. KSRTC is actively modernising its fleet with new BS-VI diesel models. KSRTC received several awards in recent years, including the national award in 2022 for its City Circular Service and Grama Vandi project from the Ministry of Housing and Urban Affairs, and National Public Transport Excellence Awards in March 2024.

Road Safety

Several initiatives have been taken to enhance road safety in Kerala, including the following.

Motor Vehicles Department (MVD). The MVD leverages digital enforcement with cameras and smart card technology, deploys mobile patrolling squads, and mandates GPS tracking devices and panic buttons in public transport vehicles. They actively conduct diverse public awareness programmes to promote safe driving practices and encourage responsible road behaviour.

National Transportation Planning and Research Centre (NATPAC). Utilising accident data till 2022, Kerala has identified and classified 4,592 crash black spots and hazardous locations, and prioritised 374 for immediate intervention. It has also identified over 2,200 km of vulnerable road stretches on National and State Highways. This comprehensive approach enables the conduct of targeted studies and research.

Public Works Department (PWD). The Department play an important role in the engineering aspect of road safety, including the design, construction, maintenance of roads and improvements to rectify identified black spots and vulnerable stretches.

Kerala Road Safety Authority (KRSA). KRSA coordinates and implements road safety programmes across various Government departments and District Road Safety Councils. It also manages a dedicated Road Safety Fund to finance essential initiatives, including mass education campaigns, improvements to black spots, the adoption of technology for enforcement, and crucial emergency medical assistance.

Mission Zero programme. Launched in November 2023, this Government of Kerala comprehensive initiative aims for zero road accident fatalities by 2030, with an interim target of a 50 per cent reduction by 2025. This ambitious goal is pursued through a five-pronged strategy focusing on engineering, enforcement, education and engagement, emergency trauma care, and enactment/evaluation.

Port, Lighthouses, and Shipping

Port development in the 13th and 14th Five-Year Plan period

The 13th Five-Year plan aimed at increasing passenger and cargo traffic, promoting tourism by developing ports, and developing costal shipping. In addition, the Plan envisioned steps to increase employment opportunities and enhance competitiveness of ports in the State. The 14th Five-Year Plan envisaged the integration of port development with other sectors of economic growth and development to encourage port-led industrialisation.

Major policy initiatives

The major initiative in the port sector is the Kerala Maritime Board Act, 2017 which envisages the development of minor ports, and coastal shipping and navigation in the State. The Kerala Maritime Board was established based on the Act on September, 2017.

Box 21.1
Vizhinjam International Seaport Ltd (VISL)

A significant transformative initiative in recent years is the development of the Vizhinjam International Seaport. It is an ambitious project designed to position Kerala as a major transhipment hub in South Asia. It is conceived to compete with international ports such as Colombo and Singapore. Vizhinjam offers a natural depth (more than 20 meters), minimal dredging requirements, and close proximity (10 nautical miles) to the international east–west shipping route. The Vizhinjam international seaport is the only project of Government of Kerala that has been identified and prioritised by the Ministry of Ports, Shipping and Waterways in its vision document, the Maritime India Vision (MIV) 2030.

Vizhinjam International Seaport is the only deep-sea port in India. The Port officially commenced its services on December 3, 2024 (Commercial Operation Date). The Port had started its operations on a trial basis from July 12, 2024. As of November 30, 2025, the Port handled a total of 13,13,609 containers of Twenty-Foot Equivalent Units (TEUs) from 611 vessels and generated a revenue of Rs 534.6, of which, Rs 96.2 crore has been collected as GST. The Government of Kerala has spent Rs 1,475 crore on VISL so far.

A container vessel named, MSC Clause Girardet, an Ultra Large Container Vessel (ULCV) category vessel with 24,116 TEU capacity docked at the port on the September 13, 2024.

MSC Turkiye, one of the largest container ships, arrived at the port on April 10, 2025. A container vessel named MSC IRINA, the largest container ship measuring 399.9 m in length and 61.3 m in width, with a capacity of 24,346 TEUs, arrived at Vizhinjam June 9, 2025. It is first time the vessel has docked in South Asia.

The State Government has also conceptualised the Vizhinjam–Kollam–Punalur industrial and economic growth triangle, which will be implemented through KIIFB. This initiative aims to leverage the potential of Vizhinjam port for the State's benefit

The Government of Kerala has introduced a series of interventions for infrastructure investments (such as Vizhinjam International Seaport), and ecosystem development (coastal shipping promotion, maritime training, and environmental planning) considering the need for holistic development of the sector. The State Government has approved the DPR of Malabar International Port and SEZ Limited (MIPSL) in August 2024.

The agencies involved in port-related activities in the State are the Kerala Maritime Board (KMB), Harbour Engineering Department (HED), Hydrographic Survey Wing (HSW), Vizhinjam International Seaport Ltd (VISL), Cochin Port Trust (CPT), Kottayam Port and Container Terminal Services Pvt Ltd (KPACT) and Malabar International Port and SEZ Ltd (MIPSL).

Kerala Maritime Board (KMB) controls, manages and operates 17 non-major ports (notified under Indian Ports Act 1908). Out of the 17 notified non-major ports in Kerala under Kerala Maritime Board, only four — Vizhinjam, Kollam, Beypore, and Azhikkal — are fully operational. Apart from the non-major ports under KMB, there is one major port in Kochi which is ministered by the Cochin Port Trust. The first transhipment terminal in India, the Kochi International Transhipment Terminal (ICTT) at Vallarpadam was commissioned on February 11, 2011. The Vizhinjam International Sea Port (VISL) is being developed on PPP mode is administered by Adani Vizhinjam Private Port Ltd. (AVPPL). The Kottayam Port and Container Terminal Services (KPACT) and Inland Container Depot (ICD), is promoted by KINFRA. Malabar Port and SEZ is an SPV formed for the development of a PPP port at Azhikkal.

The Government of Kerala has spent Rs 1,869 crore on the ports sector (excluding VISL) between 2016-17 and 2024-25.

Major achievements

Port development. The following works were undertaken in non-major ports sector between 2016-17 and 2024-25 (Table 21.5).

Table 21.5 *Works undertaken in non-major ports, 2016-17 to 2024-25*

Sl.no.	Port	Development works
1	Azhikkal	Crane, weighing machine, automated cargo handling gears, tug, ISPS compliance
2	Beypore	Crane, solar panel installation, transit shed, dredging works, CCTV, ICP compliance, automated cargo handling gears, ISPS compliance
3	Vizhinjam	Wharf, weighing machine, transit shed, ISPS compliance, ICP compliance
4	Alappuzha	Maritime training hall, solar panel installation
5	Thalassery	Solar panel installation
6	Kollam	Wharf, automated cargo handling gears, dredging works, berth, ICP compliance, ISPS compliance
7	Ponnani	Dredging works

Source: Kerala Maritime Board

Inland vessel rules. Kerala Maritime Board is the nodal agency for the implementation of the provisions in the Act related to the registration and survey of mechanised inland vessels. As part of this, KMB conducts inspections and facilitates registration of vessels. From 2016-17 to 2024-25, 7,814 vessels were inspected, of which, 5,596 vessels were found to be perfect and 2,218 were found to be defective. A total of 2,317 vessels were registered between 2016-17 and 2024-25.

Cargo growth and operational efficiency. The State's investments in non-major ports development yielded results, particularly in cargo handling capacity and service diversification. The export cargo (coastal) is higher than import cargo (coastal) in non-major ports. The total cargo handled (export and import) from Kerala increased from 84,750 tonnes in 2023-24 to 1,01,479 tonnes in 2024-25.

Port activities and operations. Between 2016-17 and 2024-25, 4,296 vessels (break-bulk ship, mini container vessel, passenger vessel, mini bulk vessel, *urus*, research vessels, barges and yachts) arrived at the operational ports in the State, including 2,140 steamers and 2,156 sailing vessels. Of the four fully operational ports in Kerala, Beypore (Kozhikode) was the busiest port during the period in terms of the number of vessels that arrived (3,338). This was followed by Vizhijnam (635), Kollam (271), Azhikal (50) and Kodungalloor(1).

Cochin port. The cargo handled by the Cochin Port increased from 25 million tonnes in 2016-17 to 37.6 million tonne in 2024-25. The Vallarpadam Terminal, which is part of the Cochin Port Trust, can handle cargo up to one million TEUs (Twenty-foot equivalent units) per annum. It is operated by the Dubai Ports World (DPW).

Maritime institutes. KMB operates two institutes, at Neendakara and Kodungalloor, for training on Inland Vessel-related courses. From 2019-20 to 2024-25, 3,340 students have graduated from the various courses offered at these institutes.

Other achievements

A major milestone in the recent history of Kerala's port sector is the establishment of a crew change facility at the Vizhinjam International port. The first crew change operation took place on July 15, 2020 for cargo vessel MV Ever Globe. Between July 15, 2020 and July 29, 2022, the facility enabled 6,389 crew sign-ons and 6,072 crew sign-offs across 735 vessels, earning a revenue of Rs 9.5 lakh from crew change operations.

The Hydrographic Survey Wing (HSW) has introduced digital applications, such as Jalanethra Hydrographic Survey Management System, a web-based system which facilitates a platform for the customers for availing survey related services; Theeram, an android mobile application useful to HSW marine surveyors for the internal communications and to manage internal operational processes; and Hydrographic Data Management System (HYMSYS), an open-source Web-based GIS platform to transform the Hydrographic Data Management process by transitioning to a digital model. These tools serve a diverse array of beneficiaries from local fishing communities to State and national agencies.

Inland Water Transport

Kerala has a rich network of backwaters, rivers, and canals, making inland water transport a vital and environmentally-friendly mode of transportation. The State Water Transport Department (SWTD), Coastal Shipping and Inland Navigation Department (CSIND), Kerala Shipping and Inland Navigation Corporation (KSINC), KWIL, and National Water Authority of India (NWAI) are the agencies involved in the sector.

The Coastal Shipping and Inland Navigation Department is involved in the development of waterways and the promotion of inland water navigation in Kerala. The Department has undertaken various works for the expansion and development of waterways and allied infrastructure to ensure the free movement of all types of vessels. It also includes the rejuvenation of the West Coast Canal from Kovalam to Bakel and its feeder canals.

The West Coast Canal (WCC) is a series of canals connecting backwaters and rivers. The total length of the canal is 616 km, from Kovalam in Thiruvananthapuram District to Bekal in Kasaragod District. The development of the Canal for both cargo and passenger movement is a priority of the State Government.

The development works, funded by KIIFB, are planned to be implemented in three phases. In the first phase, approximately 233 km from Akkulam to Chetuva will be completed and made fully navigable by 2026. In the second phase, the canals at various places covering a distance of approximately 85 km will be fully developed and the bridges at necessary places will be reconstructed. In the third phase, the canals at various places covering a distance of 61 km, including the Kozhikode Canal City Project, will be completed and the terminals of the West Coast Canals and the development of the feeder canals will be implemented.

Kerala State Water Transport Department (SWTD) is the primary Government agency responsible for passenger and cargo transportation through inland waterways in Kerala. It operates a wide range of services, including passenger ferries, car ferries (Ro-Ro), and tourist boats. The State Water Transport Department (SWTD) has made significant strides in sustainable and efficient water transport.

In 2017-18, the department launched the Aditya solar ferry on the Vaikom-Thavanakkadavu route. It was the first solar ferry in the country and earned international recognition. Following this, in 2018-19, the SWTD introduced the Vega series of high-speed catamaran ferries, lauded as Kerala's fastest public transport vessels. These were deployed on routes such as Vaikom-Ernakulam-Fort Kochi, drastically cutting down travel times and boosting efficiency. In 2023-24, the SWTD unveiled Indra, India's first solar cruise and largest solar boat. The efforts of the SWTD reflect a shift to modern, sustainable technology and potentially paving the way for new tourism services from Fort Kochi.

Revenue from inland transport for SWTD rose from Rs 6.7 crore in 2016-17 to Rs 10.9 crore in 2024-25.

Another unique initiative is the Kochi Water Metro which started operation in April 2023. The distance serviced by the Kochi Water Metro nearly tripled from 8.7 km in 2023-24 to 25.1 km in 2024-25. The number of boats increased from 12 to 18, and operational boats from 9 to 14, facilitating a rise in scheduled trips from 39,770 to 54,408. In this time period, the ridership increased from 18 lakh to 21 lakh. Correspondingly, revenue from inland transport surged from Rs 413.2 lakh to Rs 813.6 lakh, and revenue from other business increased substantially from 5.2 lakh to 50.7 lakh.

The Kerala Shipping and Inland Navigation Corporation (KSINC) is a public sector undertaking of the Government of Kerala engaged in marine and inland navigation activities including shipbuilding, ship repair, operation of passenger and cargo vessels, and promotion of water tourism.

Projects completed in the 13th and 14 Five-Year Plan include construction and operationalisation of four barges, four passenger vessels, and a ferry terminal jetty. The company operates two yards at Thevara and Thoppumpady for the construction and repair of vessels. KSINC has built and supplied nearly 50 vessels to date.

From 2016-17 to 2024-25, total revenue receipts of KSINC on inland transport has more than doubled from Rs 823.8 lakh to Rs 2,173.2 lakh.

Other Transport Services

While Railway development has mainly been undertaken by the Union Government, the State has invested well in the other areas which have witnessed progress. Between 2016-17 and 2025-26 (till July 2025), Kerala has spent more than Rs 6,889 crore in developing these services.

Rail transport. Railways, being a subject in the Union List of the Constitution, fall under the jurisdiction of the Union Government. This limits the State's ability

Box 21.2
Activities Planned for in the Kerala Port Sector

Kerala Maritime Board

Development of land and other assets under non-major Ports on PPP mode

The Board has taken steps to develop the land and various assets under the non-major ports viz building, bungalows, godowns, warehouses, and light houses on PPP mode. Expressions of Interest have been invited for the development of the port bungalow in Kozhikode and the process to select the private partner is in progress. Other major projects on the anvil are for the Valiyathura port, Azhikkal, Thalaserry sea pier, and Alappuzha port.

Kerala's Maritime Board is working to restart coastal cargo movement between non-major ports and Cochin Port, as most EXIM cargo is handled in Cochin Port. The Board is in discussions with trade bodies and vessel operators.

A proposal for the establishment of a cruise-cum-passenger ship operation between Dubai and ports in Kerala to help diaspora in the Middle East was actively considered by KMB. An EoI has been floated and further initiatives are underway.

Malabar International Port and SEZ Ltd

The Government of Kerala has created an SPV, Malabar International Port and SEZ Ltd (initially incorporated as Azhikkal Port Ltd) to develop a new seaport (280 km north of Kochi and 140 km south of Mangalore ports), adjacent to the riverine Azhikkal port intended to develop blue economy of the Malabar region and its logistics with improved connectivity and infrastructure. The objective is also to develop land in SEZs and industrial parks for port-dependant and other industries with the assistance of Kerala/Union Governments, infrastructure development agencies and private partners.

Initiatives to leverage the potential of Vizhinjam port

Port-linked infrastructure development, the Vizhinjam Railway line construction, construction of the Vizhinjam–Navayikulam outer ring road and development corridor in Thiruvananthapuram and Vizhinjam–Kollam–Punalur industrial and economic growth triangle.

to independently implement large-scale rail projects and has long shaped the pace and pattern of railway development in Kerala. While the State can initiate proposals and provide local support, the execution and financing of major infrastructure projects remain primarily with Central agencies. As a result, Kerala has often experienced delays and underinvestment relative to its mobility needs and economic aspirations.

The National Rail Plan (NRP) of 2020 outlines a long-term vision for development in the sector till 2051. It identifies that the Kerala railway corridor is operating well beyond its designed capacity, with trains running on crowded single and double lines that leave little room for expansion or speed enhancement.

To address this, the State requires, and which the NRP also proposes, is the establishment of the third and fourth lines across the State, and that these additional lines be established as a semi high speed corridor. This is essential not only to enhance mobility, but also to catalyse industrial and economic growth. Kerala faces an urgent need for faster and more reliable north–south rail connectivity to substantially reduce travel time between the northern and southern ends of the State, to transform passenger mobility, improve connectivity between major urban and industrial centres, and relieve pressure on Kerala's overburdened road network. Beyond transport efficiency, this is also expected to stimulate regional development, attract industrial investment, and foster new economic clusters along its alignment. Moreover, it would integrate Kerala into the emerging network of interstate high-speed corridors, ensuring seamless connectivity with neighbouring states and the broader national transport grid.

Metro rail. Kerala has completed Phases I, IA, and IB of the Kochi Metro Rail project. Future network expansion plans include an 11.2 km Phase-II extension from Jawaharlal Nehru Stadium to Infopark, Kakkanad, which is expected to be completed by December 2026. A 14-station Phase-III corridor from Aluva to Angamaly has been proposed and is awaiting approval from the Union Government. From its inception in 2017 to 2024, Kochi Metro's ridership experienced strong initial growth with a pre-pandemic peak in 2019 (166.7 lakh), which was followed by a sharp drop in

2020 (58.6 lakh) largely attributable to the Covid-19 pandemic. Post-pandemic recovery was robust, with ridership increasing from 2021, and peaking at over 350 lakh in 2024. To enhance last-mile connectivity, KMRL operates 15 feeder buses covering 40 km and serving around 4,000 daily passengers. Additionally, 75 e-autos run from major stations, catering to 110–345 daily passengers within a 5 km radius, and 15 EV charging stations with Halt and Go infrastructure have been installed at various stations. KMRL also offers an e-bus charter service for convenient, economic travel. KMRL, in collaboration with Cochin Smart Mission Limited (CSML), is undertaking infrastructure development for inclusive mobility through pedestrian and cycling projects, aligned with the concept of station-oriented development.

Kochi Metro has shown significant improvements in its financial performance, transitioning from initial operating losses to operating profits. Revenue earnings have consistently increased, reaching Rs 168.2 crore in 2023-24, despite a temporary dip in 2020-21. This growth enabled the metro to move from operating losses of Rs 43.3 crore in 2017-18 and Rs 72.4 crore in 2020-21, to achieving operating profits of Rs 5.6 crore in 2022-23 and Rs 23 crore in 2023-24, reflecting a dynamic growth trajectory and enhanced efficiency.

Aviation. The State operates four international airports — Thiruvananthapuram, Kochi, Kozhikode, and Kannur — providing vital global and domestic connectivity. Despite a sharp decline during the Covid-19 pandemic, major airports have seen passenger and aircraft traffic strongly rebound. Similar to passenger movement, aircraft movements across all airports show a general upward trend. Cochin International Airport (CIAL) consistently remains the busiest in Kerala, especially for international traffic. Kannur International Airport's establishment in late 2018 added significant capacity and redistributed some traffic.

Kerala is also developing the Sabarimala Greenfield International Airport in Kottayam District. Future expansion in the sector includes regional airstrips and intra-State routes, focusing on sustainability and connectivity to remote areas.

Cochin International Airport Ltd (CIAL) continues its trajectory of innovation and expansion. Its International Terminal 3 (T3) is undergoing a significant expansion, including a larger apron and terminal building with more aerobridges, expected to enhance passenger handling capacity and reduce congestion by late 2025. CIAL (Cochin International Airport Limited) has won the prestigious Green Airports Recognition 2025 award, instituted by the Airports Council International (ACI) Asia-Pacific and Middle East. Complementing this physical growth, CIAL launched a Rs 200 crore CIAL 2.0 project in May 2025, aiming for full digitalisation of airport operations. This initiative incorporates AI-powered monitoring with 4,000 cameras, automated screening, full-body scanners, and automated baggage systems to bolster security, efficiency, and passenger flow. CIAL has also diversified its revenue streams by commissioning a state-of-the-art Business Jet Terminal and developing commercial zones, retail outlets, and a 5-star hotel within airport premises.

Thiruvananthapuram International Airport is undergoing a major transformation. Expansion of Terminal 2 (international terminal), is planned with an investment of Rs 5,500 crore, which aims to increase annual passenger capacity from 45 lakh to 120 lakh. While the initial target for completion was January 2034, the master plan is being revised to expedite the process. Concurrently, refurbishment of Terminal 1 (domestic) is progressing, including new canopy installation and improved parking. The airport is also implementing cutting-edge cleaning technology, increasing check-in counters and e-gates, providing free Wi-Fi coupon kiosks, and enhancing city transfers for improved passenger experience.

Kannur International Airport (KIAL) is strategically positioning itself within the aviation landscape. The airport commenced Hajj Operations in 2023, serving pilgrims from the northern parts of Kerala. Beyond passenger services, KIAL is focusing on fostering aviation-related skill development in the region, exemplified by partnerships such as the Memorandum of Understanding (MoU) with the Rajiv Gandhi Flying Training Academy (RAGAAT). This indicates a forward-looking approach to developing aviation talent and supporting the broader aerospace industry.

Calicut International Airport (CCJ) is prioritising safety and capacity enhancement. The airport successfully completed the re-carpeting of its 2.9 km runway in 2023 at a cost of Rs 60 crore, which involved milling, glass fibre reinforcement, and fixing runway centre line lights and touchdown zone lights to strengthen safety standards. Further critical safety work for the Runway End Safety Area (RESA) development was awarded in February 2024, following the State Government's handover of 12.5 acres of land to the Airport Authority of India to ensure international

compliance. Looking ahead, there are plans to extend the runway to 3,500 meters and acquire an additional 96 acres of land for a 75-meter runway strip on each side, which are crucial steps for accommodating larger aircraft and further enhancing safety at the airport.

Kerala's aviation sector faces significant challenges including capacity constraints and congestion, particularly at major hubs like Thiruvananthapuram and Kochi, which require continuous capacity expansion to meet growing passenger and cargo demand. Kannur International Airport's "point of call" status is a key issue. A "point of call" designation allows foreign airlines to operate regularly scheduled flights to and from an airport.

Strategic expansion and modernisation of existing airports, including Thiruvananthapuram's T2 and CIAL's expansion is on-going under Flying into Tomorrow initiatives with potential for a second runway. Developing air cargo hubs with enhanced cold storage and customs facilities across all international airports is essential to capitalise on Kerala's export potential in perishables. Kerala can gain more in the aviation sector by promoting air connectivity through incentives for airlines and passengers, enhancing passenger experience and a continued focus on sustainability.

Challenges

Kerala's transport sector faces multiple challenges.

Road infrastructure. Challenges in road infrastructure include high land acquisition costs, rehabilitation and resettlement issues, and the rapid growth in vehicle ownership. Inter-departmental coordination is complex, as road projects are associated with many utilities including water, drainage, electricity, and digital infrastructure. Urban congestion, safety concerns, and pressure on existing road networks further strain the system, particularly in densely populated areas.

Ports. Kerala's port sector confronts structural and operational challenges such as land acquisition and rehabilitation bottlenecks, environmental and regulatory clearances, and competition from neighbouring ports. Limited hinterland industrial activity constraints cargo volumes, while rapid technological change in port operations necessitates continuous upgrades in systems, equipment, and skills. These factors together affect operational efficiency and long-term competitiveness.

Inland water transport. Challenges faced by the inland water transport system include seasonal variations in water levels which significantly affects navigability. Sry seasons lead to shallow channels and disrupted services, while monsoons bring strong currents, debris, flooding risks, and safety concerns. Increased siltation further reduces channel depth and raises maintenance costs. In addition to the rapidly developing road sector, Kerala's high population density, fragmented landholdings, and widespread encroachments make land acquisition for terminals, jetties, and related infrastructure complex, costly, and socially sensitive.

The extensive and well-developed road network, offering faster speeds and door-to-door connectivity, has reduced the competitiveness of inland water transport for both passengers and freight.

Way Forward

In Kerala, the transport sector operates under distinctive pressures. The State's geography with a 580 km coastline, a narrow width of only 120 km, three contrasting regions (coastal plain, midlands, and highlands), and 44 rivers creates natural constraints. These are compounded by the State's dense population and urban sprawl. Meeting present and future mobility needs therefore requires not just incremental improvements, but a long-term approach that emphasises the need for energy-efficient and fast multimodal mass transportation systems.

Road infrastructure. The way forward for Kerala's road sector lies in building an integrated, resilient, and future-ready transport network that responds to rapid motorisation and urbanisation. The State's priorities include expansion and upgradation of Major District Roads and key State Highways into double- and four-lane corridors, supported by sustained capital expenditure. Strengthening inter-departmental coordination is essential to address recurring issues related to utilities such as water supply, drainage, electricity, and digital infrastructure, and ensuring coordinated planning and execution.

The modernisation of roads and bridges will be accompanied by a strong emphasis on road safety, asset management, and climate resilience.

The path to safe roads involves comprehensive action encompassing stricter law enforcement, road engineering improvements, public awareness campaigns, mandatory safety education, and enhanced post-accident care. The Kerala Road Safety Authority is spearheading the efforts to implement a Road Safety Action Plan and cultivate a culture of responsible road use, aiming for a substantial reduction in accidents and fatalities by 2030.

KSRTC will continue its efforts in modernisation and technological integration, including real-time tracking, digital payments, and AI-driven route optimisation, to enhance efficiency and passenger

experience. Concurrently, financial restructuring and revenue diversification are crucial, necessitating Government support for pension liabilities and the exploration of non-fare box income sources such as commercial complexes at bus stands or leasing depot spaces.

MVD aims to strengthen its workforce, and establish Automated Vehicle Testing Stations, and leverage digital transformation to deliver citizen-centric services including online services. Strengthening traffic enforcement through initiatives such as the Safe Kerala project and continuous public awareness campaigns are crucial to enhancing road safety and reducing accidents and injuries across the State.

Promoting public transport, electric vehicles, and non-motorised transport, alongside the adoption of smart mobility solutions and intelligent traffic systems, will help reduce congestion and environmental impacts. A multimodal approach integrating roads with rail and inland waterways will be adopted, one that improves freight efficiency and supporting economic growth.

Ports. Kerala's maritime strategy aims to transform the State into a globally competitive, environmentally sustainable, and technologically advanced maritime economy by 2035. The focus is on port-led industrialisation supported by hinterland development and industrial corridors, strengthened Public–Private Partnership models, and international collaboration in shipping, logistics, and maritime education. The Government will promote the digitalisation and adoption of emerging technologies for efficient and transparent port management, climate-resilient infrastructure, and environmentally responsible use of marine resources. Inclusive growth, with active participation of coastal communities, will remain a core principle of the State's port development strategy.

Inland water transport. The way forward for inland water transport lies in adopting a targeted, multimodal and climate-resilient approach. Priority waterways need to be selectively developed with assured navigability through scientific dredging, bank protection, and improved water management practices. Investment in modern vessels suited to varying water conditions, along with better terminal infrastructure and last-mile connectivity, can enhance reliability and user confidence.

Major initiatives include the State Water Transport Department's plan to convert 50 per cent of its fleet to solar power, with Vaikom proposed as Kerala's first fully solar-powered ferry terminal. The Department is expanding daily services across Districts, inducting new boats, and introducing premium passenger and tourism-oriented services in the Kochi backwaters. Proposals include a floating dock at Fort Kochi, dinner and short-cruise services from Marine Drive, tourist connectivity to Kakkathuruthu Island, and cultural circuits linking Kuttanad and Pathiramanal. New and revived routes — such as Kadamakudy–Paliyam Thuruth, High Court–Mattancherry, and Arookutty–Ernakulam — are expected to improve accessibility and ridership. Kerala Shipping and Inland Navigation Corporation (KSINC) plans to commission a new self-propelled cruise vessel and a bulk barge, while strengthening fleet maintenance through its Slipway Complex. KSINC will also expand the construction and supply of FRP boats, improving operational reliability and supporting the long-term sustainability of inland water transport services.

Chapter 22
Sustainable Energy Infrastructure

Kerala achieved the status of a fully electrified State in the year 2017. The State's proactive measures, including renewable energy adoption and infrastructure enhancements, have worked towards ensuring a stable and sustainable power supply, in line with the State's commitments for low carbon development. Kerala has emerged as a front runner on rooftop solar (RTS) adoption in the country. As of August 2025, Kerala had installed RTS capacity of 1.5 GW; this constituted 81 per cent of total installed solar capacity. Progressive interventions, such as the mainstreaming of grid-connected RTS by means of the State's flagship Soura programme in 2019-20, facilitated this achievement.

A robust transmission infrastructure through the Transgrid 2.0 programme was initiated during this period keeping in view the energy import requirements of the State. Kerala has maintained a consistent power supply without load shedding for the last decade, and brought Aggregate Technical and Commercial losses down to 6.61 per cent in 2024-25, becoming one of the best-performing States in the country.

Energy occupies a central position in Kerala's development efforts. The major focus of the energy sector is on energy security, energy quality and efficiency, scientific management, and safety. The energy sector has been taking concrete effort towards green transition. The State's focus during the 13th and 14th Five-Year Plan period was on ensuring energy security keeping in view the Kerala specific constraints on land availability and environmental concerns around developing hydro energy resources within the State.

Power Sector Agencies

The power sector agencies in Kerala are the Kerala State Electricity Board Limited (KSEBL), Agency for Non-conventional Energy and Rural Technology (ANERT), Energy Management Centre (EMC), and the Department of Electrical Inspectorate.

The Kerala State Electricity Board (KSEB), a public sector undertaking, plays a pivotal role in the generation, transmission, and distribution of electricity. ANERT plays an important role in promoting the adoption and development of renewable energy sources. It is the nodal agency for the Ministry for New and Renewable Energy (MNRE) to carry out the Government of India's programmes in the State. EMC is the agency established by the State Government to enforce the Energy Conservation Act, 2001, to promote energy efficiency and energy conservation practices across various sectors. The Department of Electrical Inspectorate is responsible for ensuring electrical safety and compliance with safety regulations throughout the State.

Energy Sector in the 13th and 14th Five-Year Plan

The 13th Five-Year Plan proposed the enhancement of domestic capacity of power generation through hydel, solar, and wind projects, strengthening of the transmission and distribution network, providing electricity to all households, substantial expansion of large-scale solar power generation, enhancing customer satisfaction through user-friendly systems, and the development and demonstration of suitable renewable energy technologies. In the 14th Five-Year Plan (2022-2027), the priority has been to increase power generation to meet the increasing demand.

Between 2016-17 and 2024-25, Rs 15,713.2 crore was spent on the power sector.

Kerala Power Policy 2019

The major emphasis of the energy sector in Kerala has been on meeting the increasing demand by enhancing power generation through hydel, solar, wind, and other renewable sources. Key objectives of the Kerala Power Policy, 2019 are to:

- Transform Kerala's power sector to provide electrical infrastructure services matching global standards;
- Create a modern electric network that is reliable, safe, efficient and smart;
- Meet the electrical energy requirements of the State continuously and without restrictions;
- Balance the need of sourcing power at the most competitive rates and at the same time, ensuring energy security of the State;
- Enhance the share of renewable energy in the generation mix, addressing its variability using appropriate technology with a framework for sharing associated costs;
- Keep the price of electricity affordable and at the same time, ensure financial health of the electricity industry;
- Bridge the gap between consumer expectations and actual levels of service delivery through organisational revamping and increased utilisation of information technology; and

- Overcome limitations of the present electrical industry structure to offer next generation services in areas such as renewable energy, energy efficiency, Electric Motor Vehicles, storage technologies, etc.

The new draft Kerala Energy Policy, 2025 plans for the growth of Kerala's power system in the coming years to aid in the development of the State, while duly considering the aspects of energy sustainability, security, reliability, accessibility and affordability, with the vision of "Powering Kerala Sustainably".

Major Initiatives and Achievements in the 13th and 14th Five-Year Plans

Generation

The power sector in Kerala has witnessed significant growth and transformation. The State sector holds the majority of the installed capacity (2,409.8 MW), and along with the central sector (359.6 MW), contributes the lion's share of power generation (70 per cent of the installed capacity in 2024-25.

At the same time, the private sector has emerged as a key driver of new capacity addition. The private sector showed rapid growth from 387.2 MW in 2016-17 to 1,642.8 MW in 2024-25, primarily through renewable solar energy.

The total installed capacity of power increased from 2,967.3 MW in 2016-17 to 4,412.1 MW in 2024-25. Hydroelectric power remains the dominant source (51.8 per cent in 2024-25) which highlights the historical reliance on Kerala's natural water resources for power generation. A notable trend in the energy mix is the enhanced contribution from renewable sources. In particular, solar power has emerged as a significant player, with 34.4 per cent of the total capacity in 2024-25, from 2.8 per cent in 2016-17, indicating the strong policy push and investment in solar energy infrastructure. Thermal power contributed about 12 per cent and wind power accounted for 1.6 per cent of the installed capacity in 2024-25. Table 22.1 shows the source-wise contribution to the installed capacity from 2016-17 to 2024-25.

KSEBL is the dominant power utility agency in Kerala, with an installed capacity of 2,409.8 MW as of March 31, 2025, of which, 2,196.4 MW was generated from hydel sources, 160 MW from thermal plants, 51.4 MW from solar plants, and 2 MW from wind farms. From 2016-17 to 2024-25, the State commissioned various hydroelectric projects such as Thottiyar (40MW), Pallivasal Extension (66 MW), Peruvannamoozhi (6MW), Poringalkuth (24 MW), and various other projects including solar. All initiatives in the power generation sector reinforce the State's commitment toward a sustainable energy transition.

Consumption

Kerala's energy needs, peak power demand, and electricity consumption trends have been steadily growing. In 2016-17, peak demand was 4,004 MW, which increased to 5,797 MW in 2024-25. Total electricity consumption for 2016-17 was 20,452.9

Table 22.1 *Energy source and share in Kerala, 2016-17 to 2024-25* in MW and per cent

Source of Energy	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Hydel	2,108 (71)	2,126 (71.5)	2,129.4 (71)	2,129.4 (69.3)	2,129.5 (70.3)	2,137.1 (67.9)	2,173.6 (61.8)	2,183.6 (57.2)	2,284.4 (51.8)
Thermal	718.4 (24.2)	676.5 (12.7)	676.5 (22.5)	686.5 (22.3)	529.5 (17.5)	529.5 (16.8)	536.5 (15.3)	536.5 (14.1)	536.5 (12.2)
Wind	59.3 (2)	60.3 (2)	60.3 (2)	70.3 (2.3)	70.3 (2.3)	70.3 (2.2)	70.3 (2)	71.3 (1.9)	71.5 (1.6)
Solar	81.6 (2.8)	112.3 (3.8)	134.1 (4.5)	186.9 (6.1)	300.4 (9.9)	409.1 (13)	734.4 (20.9)	1,027.4 (26.9)	1,519.7 (34.4)
Total	2,967.3	2,975.6	3,000.4	3,073.1	3,029.7	3,146	3,514.8	3,818.8	4,412.1

Source: Kerala State Electricity Board

MU, which increased to 29,311.8 MU in 2024–25. The total number of consumers increased from 1.2 crore to 1.4 crore in 2024-25. The per-capita electricity consumption in Kerala has shown a steady upward trend from 592 kWh in 2016-17 to 816 kWh in 2024-25, marking an overall increase of approximately 38 per cent over the decade. This growth, with a compound annual growth rate (CAGR) of about 3.9 per cent, reflects gradual but consistent improvement in household and commercial energy use, driven by economic development and urbanisation.

Enhancing customer satisfaction through user-friendly, IT-enabled services was given priority during the 13th and 14th FYPs. Schemes including Cloud Telephony Services for consumers to register complaints, request services, and obtain billing information via call and WhatsApp; automated voice call back facility, Voice Blast, to provide disconnection alerts to consumers one day before their disconnection date; and Spot Billing Machines with POS (Point of Sale) feature facilitating consumers to pay electricity charges at their doorsteps, were launched to provide better service.

Distribution and transmission

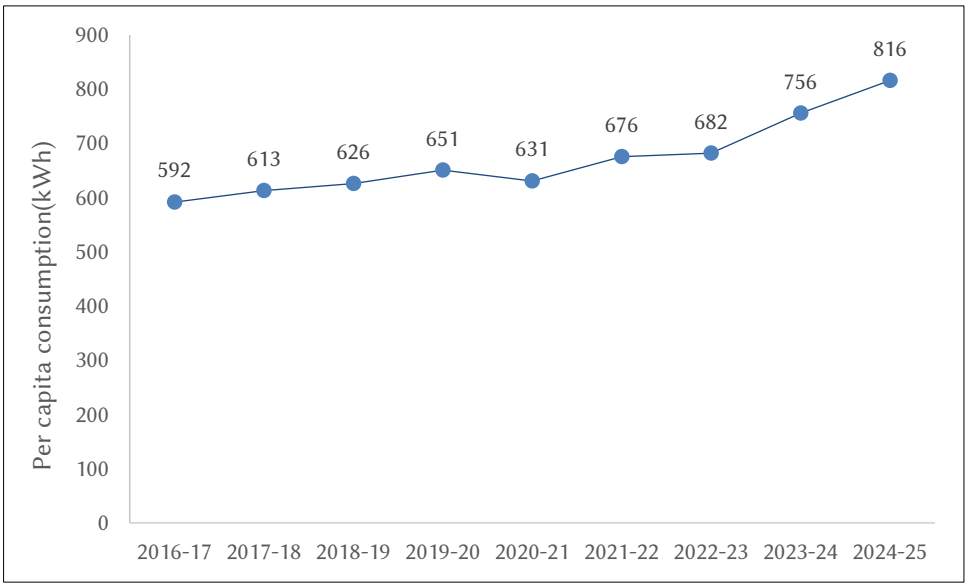
To ensure reliable power supply, Kerala has been strengthening its transmission and distribution infrastructure. Kerala's power transmission infrastructure shows notable additions. The State maintains a total of 435 substations (including six under Power Grid Corporation of India Limited (PGCIL)) and a transmission line network spanning approximately 14,803.4 circuit kilometers (including 1,813.9 km under PGCIL).

The addition of critical infrastructure elements to the electrical network during the 13th and 14th Five-Year Plan periods marked a major milestone in bolstering the State's ability to manage and sustain increased electricity demand, ensuring more robust and reliable power supply system for future needs.

Following are the major initiatives/achievements in Transmission and Distribution sectors:

- The State aimed to reduce aggregate technical and commercial losses below 10 per cent during these two Plan periods and achieved commendable success. Transmission and Distribution losses decreased from 13.9 per cent in 2016-17 to 9.27 per cent in 2024-2025.This indicates efficient power management and infrastructure upkeep.
- The Oorja Kerala Mission was launched in 2018 aimed at the integrated development of the electricity sector in the State. It aims at implementing five important projects– Soura, Filament free Kerala, Dyuthi 2021, Transgrid 2.0, and E-safe.
- The Transgrid 2.0 project was initiated, aimed at enhancing transmission capacity to meet future

Figure 22.1 *Per capita consumption of electricity, Kerala, 2016-17 to 2024-25* in kWh



Source: Kerala State Electricity Board

demand, improve reliability and quality of power transmitted, and to reduce losses. All 12 substations targeted in the first phase of the project have been commissioned, with around 1,766 circuit km of transmission lines completed.

- The Dyuthi project, spanning from 2022-23 to 2026-27, aims to upgrade KSEB's distribution grid to international standards. As part of the programme, 1,678 new distribution transformers were installed and 2,12,397 energy meters were replaced.
- In the period from 2016-17 to 2024-25, new substations were commissioned and transmission lines were added to existing network, along with capacity enhancement. The lower voltage levels (66 kV and 33 kV) saw limited development, with minor line extensions and small capacity additions. This pattern of development reflects the State's strategic emphasis on strengthening of its medium and high voltage transmission backbone to support growing demand and improve grid reliability.
- The commissioning of Kerala's first 400 kV gas insulated substation at Kottayam, 400kV Tirunelveli-Kochi-Madakkathara-Udumalpet Power highway and two 500 MVA interconnecting transformers at Kochi and Palakkad along with downstream were important achievements in the Transmission sector. The commissioning of two 500 MVA interconnecting transformers increased the State's import capacity by nearly 1000 MW, elevating it to a total of 4620 MW. A total number of 92 substations were added during the period from 2016-2025. The period also witnessed the completion of 179.7 MW projects. In 2016-17, the number of transformers was 71,195; this increased to 92,203 in 2024-25. The construction of 65 m of 11 kV overhead lines, 40 km of 11 kV underground cables, 3,040 km of LT line, and 39 km of LT underground cable, and installation of 21 transformers were carried out as part of the Total Electrification Programme.
- Mission Reconnect 2018, the project launched during the 2018 floods achieved extensive restoration including the repair of 16,158 distribution transformers, reconstruction of 1,735 distribution transformer stations, restoration of 25.6 lakh service connections, reconstruction of 5,275.8 km of distribution lines including one lakh damaged poles, replacement of three lakh single-phase and 50,000 three-phase energy meters, and restoration of 720 single-point connections where existing installations were damaged.

Renewable energy

Various initiatives for the promotion of renewable energy highlight Kerala's transition towards a sustainable energy sector.

- A significant highlight of the initiatives of the State to promote the use of renewable energy is the growth in rooftop solar installations, which have reached 946.9 MW from 1,51,922 systems, making Kerala a frontrunner in this sector.
- About 140 Akshaya Urja Service centres were started across the State to promote the adoption of renewable energy at grass root levels.
- e-Market to facilitate transparent and efficient procurement of renewable energy products and services was launched.
- A total of 176 MW (46,764 plants) have been commissioned under the Soura Project, an initiative to promote solar energy adoption.

The period from 2016-17 to 2024-25 witnessed the installation of:

- First grid-connected solar photovoltaic (PV) plant in the State in Independent Power Producer (IPP) mode at Kuzhalmannam, Palakkad (2MW).
- 1 MW solar Plant with indigenously developed power conditioning unit at Ramakkalmedu.
- 25 KWP capacity solar power plant at Palakkad (as part of the Integrated Solar Agro Farm Project).
- A total capacity of 18 MW has been installed in 514 public buildings in Thiruvananthapuram Corporation area under the Solar City Project, funded by Smart City.
- As part of the Green Income Scheme project envisaged to provide subsidised solar power plants to economically weaker families, rooftop solar systems were installed in nearly 2,000 houses constructed under the LIFE scheme. Out of these, 379 beneficiaries are houses headed by women.
- As part of solar electrification project for unelectrified tribal unnatis, hybrid power plants featuring 1 kW capacity solar panels and 500-watt capacity wind turbines were installed in each of the houses of 5 unnatis in Wayanad and Palakkad Districts. Solar street lights were also installed in this area.
- As a first step towards solarisation of all anganwadis in the State, solar power plants with a capacity of 2 kW

each have been set up by ANERT in 151 anganwadis in Chittoor, Palakkad District. Out of this, power plants have been commissioned in 90 anganwadis.

- A total number of 2,425 solar pump installations were completed. In 2024-25, a total of 1,517 agricultural pumps with a generating capacity of 4.554 MW were solarised under the PM-KUSUM project.
- Solar-Powered Cold Storage for storage of vaccines in Government Medical College, Kozhikode and solar inverter test facility at STIC (CUSAT)

Energy efficiency and energy management

The State has also placed emphasis on energy management, and some initiatives are listed here.

- Urjayaan programme which aims to convert 140 legislative assembly constituencies into energy-efficient areas.
- The Filament-free Kerala initiative started with the partnership with Local Self-Governments replaced 110 lakh filament lamps, considered instrumental in reducing mercury pollution and peak demand, with LED bulbs.
- The NILAVU programme has replaced 3,66,980 conventional street lights with LED alternatives.
- Pelicode Panchayat in Kasaragod was developed as the first incandescent lamp-free Panchayat in the State
- Conducted energy audits in various parts of the State and implemented Smart Energy programme in various schools in all Districts.
- Under the Angan Jyoti scheme, 2,810 anganwadis are being equipped with electric cooking appliances, including 2 kW induction hobs and six types of induction-compatible utensils such as pressure cookers, milk boilers, saucepans, etc. The scheme covers 92 Panchayats selected by the Navakeralam Karmapathadhi under the Carbon Neutral Panchayat Programme, as well as two Assembly Constituencies, namely Chittoor and Kazhakoottam.
- The Energy Meter Calibration Lab of EMC has calibrated 6,620 energy meters/ net meters.
- Around 2,500 awareness programmes were conducted on energy efficiency in various organisaions/ institutions/schools and more than 50,000 people were reached.

e-Mobility

There has been much progress in the use of electric vehicles in Kerala.

- The number of Electric Vehicles (EVs) registered in the State has increased exponentially from 417 in 2019-20 to a cumulative 2.3 lakh by March 31,2025. This data underlines Kerala's improvement in the sustained electric mobility.
- KSEBL has installed 63 DC fast charging stations and 116 pole-mounted charging stations for auto-rickshaws and two wheelers.
- As of March 2025, KSEB operates 63 charging stations, and another 37 are under ANERT.
- A total number of 340 electric vehicles were provided by ANERT for various departments and agencies as part of the Carbon Neutral Governance Project.
- KEMapp (Kerala E-mobility Application), for managing EV charging stations, was launched.
- The Sustainable Transport for Rural Entrepreneurs through Electric Cycles (STREE) scheme, a project for the promotion of electric bicycles for women in rural areas, was launched.

Electrical safety

The number of electrical accidents in the State has been reduced through the massive awareness programmes. In 2016-17, the total number of electrical accidents occurred in the State was 463. It fell to 362 in 2023-24. Initiatives include launch of the software e-Suraksha which helped in dealing with safety norms complaints, and a single-window digital platform for citizens and businesses dealing with electrical infrastructure and installations. Samraksha, the software which provides all services of the Kerala State Electricity Licensing Board online was launched. In order to reduce electrical accidents in the domestic sector, a project for the rewiring and standardisation of houses by installing Residual Current Circuit Breaker (RCCBs) in the houses of Scheduled Caste and Scheduled Tribe families below the poverty line has been initiated. A new regional Meter Testing Laboratory was established at Alappuzha, and nine Regional Meter Testing Laboratories got NABL accreditation for electro technical calibration in energy parameters.

Achievements

Kerala's power sector has recorded several significant achievements over the past decade. Most importantly the power sector growth strategy is fully aligned with the State's commitments for low carbon development.

Renewable Energy Expansion. The NITI Aayog's State Energy and Climate Index has recognised Kerala

Box 22.1
Projects in Pipeline

Draft Hydrogen Policy2024

Kerala is aiming to be a leader in India's green hydrogen economy by focusing on sustainable energy transition and decarbonisation. The State is finalising its Green Hydrogen Policy, with the long-term plan to achieve 100 per cent renewable energy by 2040 and net carbon neutrality by 2050.

Key objectives of the Policy

- To establish Kerala as a prominent producer, consumer and exporter of green hydrogen.
- To establish global strategic partnerships to boost green hydrogen exports.
- To reduce the cost of green hydrogen production.
- To blend green hydrogen in the State's total hydrogen consumption and replace hydrogen used in industries with green hydrogen.

Green energy initiatives

- The State has initiated the Hydrogen Valley Innovation Cluster (HVIC), a comprehensive project that spans the entire hydrogen value chain—from production (via both biogenic and electrolysis-based processes) to end-use applications and research and development.
- The State is collaborating with the World Economic Forum (WEF) to finalise Kerala's Green Hydrogen Valley Statement of Ambition (2035), which includes the deployment of fuel-cell and hydrogen internal combustion engine vehicles and the establishment of two hydrogen refueling stations along State highways.
- Floating solar projects, with the target of developing 3 GW of capacity by strategically utilising reservoirs, abandoned mining pits, and other suitable water bodies are being planned. ANERT has been designated as the nodal agency for the implementation and technical approvals of these projects, and a single-window clearance system is being facilitated for faster execution.

Source: KSEB and ANERT

as a top performer in the accessibility, affordability and reliability category. Similary, in the distributed solar development Kerala is among the top performers. Kerala ranks second in rooftop solar (RTS) deployment among the States. To maximise energy without using land, floating solar plants have been implemented. To manage the intermittency of solar and wind power, the State is actively pursuing Battery Energy Storage Systems (BESS) and Pumped Storage Projects (PSP). The Green Hydrogen Initiative is to further strengthen in the longer term the share of renewable energy use in the industry and transportation sector. On the demand side, KSEB has invested in establishing EV charging stations to support the transition to electric mobility.

Infrastructure upgradation and modernisation. Kerala has maintained a consistent power supply without load shedding for the last decade. Large investments through Transgrid 2.0 has not only upgraded and modernised the infrastructure for future energy demand, but also for climate resilience. By integrating with digital infrastructure, projects through the Revamped Distribution Sector Schemes (RDSS) have helped to improve customer responsiveness and in technical line loss reduction.

Financial and operational performance improvement. Kerala has achieved a significant reduction in Aggregate Technical and Commercial losses, down to 6.61 per cent in 2024-25 and thus ranks as one of the best-performing States with consistent improvement over the years. The improvements in operational performance have facilitated surplus, generating improved financial performance for the year 2024-25.

Challenges and Issues

- Natural disasters have delayed projects and increased operational costs, emphasising the need for climate resilience and disaster risk strategies in power planning.
- The growing demand for electricity intensifies the need to expand capacity and enhance supply reliability.

- The integration of renewable energy sources poses technical and financial challenges, particularly in maintaining grid stability and upgrading systems.
- The costs associated with the installation of renewable energy projects, including land acquisition and forest clearing for small hydro projects, are high.
- Increasing internal generation capacity is pertinent to meet energy demands and peak loads, along with exploring financially feasible contracts with external power companies.
- Regulatory challenges and project approval delays also pose development challenges, along with human resource management and skill enhancement as the sector is shifting to digital and sustainable operations.
- Addressing project commissioning delays and improving transparency in renewable energy procurement is essential.
- Additional challenges include replacing inefficient appliances, desilting dam reservoirs, and developing financing models focusing on energy savings and productivity.

Strategies and Way Forward

Having achieved the significant milestone of complete electrification, Kerala now aims to enhance energy security, promote renewable energy adoption, and ensure environmental sustainability. While the key initiatives undertaken by power sector agencies under the power sector during the 13th and 14th Five-Year Plans address the evolving needs of the power sector — from generation and transmission to energy efficiency and safety — the achievements reflect a growing installed capacity, with a notable surge in solar power, and a robust transmission and distribution network undergoing continuous modernisation. By focusing on renewable energy expansion, grid modernisation, energy efficiency, and the adoption of emerging technologies like green Hydrogen, Kerala is on the right track to achieve its goals of 100 per cent renewable energy by 2040 in terms of State-owned generation assets. However, in the light of the current reliance on imported power and Kerala's unique geographical and demographical challenges, there are some crucial issues that `need to be addressed and pursued in a strategic manner in the coming years.

Modernisation. The State's investments in smart grid technologies such as Dyuthi, TransGrid 2.0, including pilot programmes for Vehicle-to-Grid (V2G) and open energy interface systems need to be pursued aggressively through the deployment of smart meters, integrated aptly with artificial intelligence (AI) and data analytics in the current scenario of decentralised and digitised grid infrastructure. It is also essential to enhance cyber security measures in the new environment of digitalised grid framework. The energy efficiency framework and existing programmes need to be scaled beyond traditional sectors for deeper penetration across all consumer segments.

Innovation, diversification, and decentralisation. In order to pursue green energy, it is essential to finance initiatives by combining various loans, green bonds and innovative blended financing models. Kerala needs to enhance energy generation and distribution at a de-centralised level such as rooftop solar and floating solar projects. More such innovative types of decentralised programmes are required, given the land constraints of Kerala.

Kerala's prioritisation of energy storage measures such as Battery Energy Storage Systems (BESS) by 2030 and the Pumped Hydro Potential has to be seen in the context of a futuristic, energy-oriented State. However, it needs to be properly synced with the renewable energy requirements and domestic resource potential.

Chapter 23

State, Migrants, and a Shared Future : A Decade of Migrant-Centric Interventions in Kerala

Introduction

The last decade has been a period of unprecedented expansion of the outreach of the Government of Kerala towards non-resident Keralites. Emigrants form an integral part of Kerala's social life and participate actively in the State's economy, society, and culture. Advances in communication and digital technologies have further strengthened the links between non-residents and Kerala. Remittances, accounting for an estimated 28 to 38 per cent of the Gross State Domestic Product, remain a critical driver of economic growth. These inflows have expanded domestic markets and generated demand for a wide range of material and cultural goods produced within the State.

Since 2016, the Government of Kerala has fostered a renewed sense of confidence among the diaspora, reflected in its growing enthusiasm with regard to engagement and cooperation with the State. This engagement has been evident across several initiatives, most notably the establishment of the Loka Kerala Sabha, a unique forum that enables diaspora members to participate in public debates, contribute to social processes, and address issues related to migration and migrant welfare.

Government policy seeks to encourage the overseas Keralite population to save, invest, and play an active role in Kerala's economic development. It also aims to harness the expertise of skilled workers, professionals, scientists, social scientists, and other specialists for the State's development efforts. To this end, a dedicated framework of legal, administrative, and economic measures has been put in place to safeguard the interests and wellbeing of migrants.

Labour migration profile of Kerala from KMS 2023

According to the Kerala Migration Survey (KMS) 2023, the number of emigrants from Kerala is estimated at 22 lakh, closely aligning with the 21 lakh reported in KMS 2018. This relative stability is notable, especially considering the declining trend observed over the past decade. Although there is a modest increase of 32,388 emigrants in 2023, 9 out of Kerala's 14 Districts recorded a decline compared to 2018, suggesting a saturation of international migration. The total number of Non-Resident Keralites, including both emigrants and returnees, stands at 40 lakh in 2023- an increase from 34.1 lakh in 2018.

A significant development is the sharp rise in student emigration. The number of student emigrants nearly doubled from 1,29,763 in 2018 to approximately 2,50,000 in 2023. This trend highlights a demographic shift, with many emigrants now leaving at a much younger age- some as early as 17. Students now constitute 11.3 per cent of the total emigrants, indicating a growing preference for overseas education among Kerala's youth.

The Gulf Cooperation Council (GCC) countries remain the primary destination, with the United Arab Emirates (UAE) continuing as the most preferred country, overtaking Saudi Arabia in recent years. However, there has been a decline in the proportion of emigrants heading to GCC nations, from 89.2 per cent in 2018 to 80.5 per cent in 2023. Conversely, emigration to non-GCC countries rose from 10.8 per cent to 19.5 per cent. The surge in student migration and their preference for countries in Europe, North America, and other regions likely contributed to this shift.

The gender composition of emigrants is also changing. Female migration increased from 15.8 per cent of total migrants in 2018 to 19.1 per cent in 2023. Additionally, female emigrants are more likely to head to Europe and other Western countries, with 40.5 per cent opting for such destinations, compared to just 14.6 per cent of male emigrants. Educational attainment is significantly higher among female migrants- 71.5 per cent have completed degree-level education, compared to 34.7 per cent of male migrants. While men continue to dominate overall emigration, the gender gap is narrowest in Kottayam and widest in Malappuram.

Return migration has also seen a notable rise. The number of returnees is estimated at 18 lakh in 2023, up from 12 lakh in 2018. This increase is attributed to pandemic-related economic disruptions, stricter immigration controls, and reduced overseas employment opportunities.

Remittances to Kerala witnessed a dramatic surge post-pandemic, rising from Rs 85,092 crore in 2018 to Rs 2,16,893 crore in 2023- a 154.9 per cent increase. These inflows continue to play a vital role in supporting Kerala's economy, reflecting the enduring impact of migration on the State's development trajectory.

Vision

The vision of the Kerala Government, as envisaged in the 13th and 14th Five-Year Plans for the development of the Kerala diaspora, focused on supporting agencies that work for the wellbeing of the Non-Resident Keralite (NRK) community through innovative schemes and programmes, while also strengthening the activities of NORKA Roots to ensure a smooth transition to income-generating activities for migrant returnees. Furthermore, the Plans highlighted the need to enhance the role of the Loka Kerala Sabha as a platform for engagement and to channel NRK investments into the overall development of Kerala. The vision provides for:

- Measures to support activities of agencies that serve the well-being of NRK society and innovative schemes and programmes and to establish the Mechanisms to strengthen activities of NORKA Roots and provide a smooth path towards income-bearing activity for migrant returnees.
- Ways to improve welfare, social security, and safety of NRKs, including in times of disaster and emergencies.
- Setting up a real-time database for this sector from multiple sources– administrative data, survey data, and data from the finance, transportation and communication sectors.
- Strengthening the activities of the Loka Kerala Sabha and to anchor NRK investment in the development of Kerala and to develop return emigration as an opportunity for re-skilling and up-skilling.
- Providing legal aid to the needy among migrants, impart finishing skills to potential migrants through pre-emigration training, ensuring speedy authentication of relevant certificates, and regulating the activities of intermediaries and service providers.

Institutional Architecture of NORKA

Kerala's distinctive migration landscape, characterised by significant outflows of skilled and semi-skilled workers, substantial remittances, and strong transnational connections, led to the early establishment of the Department of Non-Resident Keralites' Affairs (NORKA) in 1996, a pioneering move in migration governance. NORKA, through its operational arm NORKA-Roots, ensures safe, legal, and ethical migration while providing comprehensive support to Non-Resident Keralites (NRKs) at all stages — pre-departure, during migration, and upon return — addressing issues like recruitment fraud, reintegration, distress assistance, credential recognition, and legal aid, particularly in the Gulf. Managed by a board including the Chief Minister, senior bureaucrats, and diaspora representatives, NORKA-Roots operates through nine regional and satellite offices across India.

In 2009, the Pravasi Welfare Fund Board was established under the NORKA Department to administer welfare schemes, most notably the Pravasi Pension Scheme, which provides long-term financial security for overseas Malayalis and returning migrants. Additionally, the NRI (K) Commission was set up as a quasi-judicial body to receive and resolve complaints from NRKs, thereby institutionalising grievance redressal and policy feedback mechanisms.

A key innovation in democratising migration governance was the creation of the Loka Kerala Sabha in 2017—a biennial platform that brings together elected representatives and diaspora members from around the world to engage in dialogue and provide policy suggestions. This forum reflects Kerala's commitment to participatory governance and transnational inclusion.

Building on diaspora engagement, the most recent addition to NORKA's institutional framework is the Overseas Keralites Investment Holding Ltd. (OKIH), formed during the 13th Five-Year Plan based on recommendations from the Loka Kerala Sabha. OKIH functions as an investment vehicle to channel NRK capital into strategic infrastructure projects in Kerala, thereby converting emotional ties into tangible economic partnerships.

Over the past 22 years, NORKA has developed into India's first comprehensive migration governance model, providing pre-departure counselling, safe migration guidance, distress support abroad, reintegration programmes for returnees, and avenues for diaspora investment, addressing vulnerabilities such as recruitment exploitation, lack of social protection, reintegration challenges, and limited service access in destination countries. Drawing inspiration from countries like the Philippines, Bangladesh, and Sri Lanka, Kerala stands out as one of the few Indian States with structured economic reintegration programmes for returnees, tackling issues like asymmetric information and reintegration anxiety.

From a fiscal perspective, NORKA's growing institutional importance is reflected in the expansion of its budget from Rs 25.4 crore in 2016–17 to Rs 150.8 crore in 2025–26, marking a five-fold increase in less than a decade. This upward trajectory highlights the Government's recognition of NRKs not just as remittance contributors, but as full-fledged stakeholders in Kerala's development.

Through its constellation of institutions — NORKA-ROOTS, Pravasi Welfare Board, NRI(K) Commission, Loka Kerala Sabha, and OKIH — the State has created a pioneering ecosystem for migration mobility, diaspora engagement, and reintegration governance. Kerala's model demonstrates how sub-national innovation, when combined with political will and participatory frameworks, can set global benchmarks in migration management.

Evaluation of Plan Schemes and Achievements in the 13th and 14th Five-Year Plans

The NORKA Department has instituted a multifaceted framework of interventions aimed at addressing the diverse needs of Non-Resident Keralites (NRKs) and their dependents. These initiatives are strategically designed to operate across multiple temporal and spatial dimensions of migration, encompassing pre-departure, overseas, and post-return phases. The Department's policy architecture comprises five principal programmatic domains: economic reintegration, crisis mitigation, social protection, migration governance, and diaspora relations.

Economic reintegration programmes

The Department's integrated approach reflects an understanding of migration as a dynamic process, embedding migrant welfare into Kerala's broader development narrative. At the heart of this policy matrix lies the domain of economic reintegration, targeting the sustainable reabsorption of returnees into Kerala's economy. The Norka Department Project for Return Emigrants (NDPREM), launched in 2013, is the flagship initiative in this area. It offers a dual-subsidy model combining a 15 per cent capital subsidy (up to Rs 30 lakh) and a 3 per cent interest subsidy over four years. With a vast network of 7,000 branches across 19 financial institutions, NDPREM has enabled 8,904 entrepreneurial ventures as of 2024-25. Fiscal data illustrates robust uptake, with cumulative disbursements totalling Rs 120.4 crore, surpassing sanctioned allocations of Rs 102.1 crore over twelve years. Annual utilisation peaked between 2018 and 2020 with full absorption of the Rs 15 crore budget outlay, signalling operational maturity. Crucially, the programme integrates entrepreneurial training and project documentation support, and has a projected Rs 25 crore allocation for 2025-26, reflecting its continuing strategic relevance.

To complement NDPREM, the Government of Kerala introduced the Pravasi Bhadratha scheme in response to the unprecedented wave of return migration triggered by the Covid-19 pandemic. Designed as a crisis-contingent economic intervention, this initiative has supported 13,906 livelihoods since 2021 through tailored loan products delivered via institutional partners like Kudumbashree, KSFE, KSIDC, and Kerala Bank. The scheme operationalises three distinct loan instruments: emergency working capital loans for microenterprises, asset acquisition loans for sectoral transitions, and skills-recapitalisation loans that facilitate occupational mobility. Its transition from an emergency response to a core component of Kerala's social protection infrastructure is evident from its Rs 45 crore allocation for 2025-26. The involvement of Kudumbashree further strengthens the programme's gender-responsive design and community-level reach.

The NORKA Business Facilitation Centre (NBFC) functions as a central institutional mechanism to mobilise diaspora investment and nurture entrepreneurial ecosystems. It provides sector-specific opportunity mapping, business incubation support, and capacity development through interventions such as the Entrepreneurial Training for Pravasi Cooperative Societies (ETPC). As a result, NBFC has catalysed the formation of 474 new enterprises by return migrants.

To bridge returnees with the labour market, the Norka Assisted and Mobilised Employment (NAME) platform offers a sophisticated digital solution. It employs three-pronged mechanisms: a digital skills inventory that maps returnee competencies, targeted employer outreach to establish dedicated NRK hiring quotas, and bridging training programmes to address sector-specific skill gaps. The platform utilises algorithmic job-matching technologies and employer sensitisation workshops, thereby reducing the average 6-8 month unemployment lag experienced by returnees, as evidenced in baseline studies.

An innovative dimension of Kerala's reintegration policy is reflected in the Assistance to Pravasi Sangham programme. This initiative supports the formation of migrant-led cooperative societies by providing a one-time share capital grant of Rs 3 lakh per society. By fostering collective entrepreneurship and social cohesion, the scheme operationalises principles of participatory development and offers returnees a sustainable, community-rooted economic pathway.

Together, these interventions represent a sophisticated, multi-layered policy ecosystem. NDPREM anchors long-term entrepreneurial

reintegration; Pravasi Bhadratha introduces a responsive safety net during systemic shocks; NBFC and NAME facilitate institutional and labour market connectivity; and Pravasi Sangham consolidates cooperative models of reintegration. This ecosystem addresses the needs of diverse returnee profiles, ranging from high-skilled entrepreneurs to vulnerable migrant workers, with programmatic convergence ensuring both livelihood security and upward mobility.

Distress-relief programmes

The NORKA Department has institutionalised comprehensive distress management architecture to address the acute vulnerabilities of Non-Resident Keralites (NRKs) through three synergistic interventions. At the forefront is the Santhwana scheme, Kerala's flagship migrant welfare programme, operational since 2003. With a cumulative disbursement of Rs 188.8 crore to 38,606 beneficiaries, the scheme provides need-based assistance calibrated to the severity of distress: Rs 1 lakh for death compensation, Rs 50,000 for medical aid, Rs 15,000 for marriage support, and Rs 10,000 for disability relief. The programme's consistent demand — 4,748 beneficiaries in 2024–25 and a projected 6,000 in 2025–26 — underscores how embedded it is in Kerala's social protection framework.

Augmenting this, the NORKA Emergency Ambulance Service, operational since 2018 with a Rs 75 lakh budget, provides critical healthcare mobility solutions through a specialised fleet stationed at key transportation nodes, including all four international airports in Kerala and extended hubs in Coimbatore and Mangalore. The service has conducted 2,874 medical transfers to date, including 580 in 2024–25, facilitated via a 24/7 toll-free helpline (+91 88080 12345). This intervention ensures seamless logistical support during medical crises, especially for financially vulnerable migrants and repatriated individuals.

In the wake of the Covid-19 pandemic, NORKA's Covid Jagratha Registration Portal recorded 15 lakh migrant registrations, becoming a pivotal tool in coordinating safe return protocols. Extending beyond initial registration, the department disbursed Rs 67.4 crore in one-time assistance to 1,34,828 migrants holding valid employment visas who were stranded in Kerala due to international travel bans. This targeted financial relief mitigated livelihood shocks and underscored the State's adaptive welfare capability in emergency contexts.

Additionally, the Emergency Repatriation under the NORKA Assisted Body Repatriation Scheme offers dignified logistical support for the return of mortal remains of deceased NRKs from foreign countries or other Indian States. The scheme facilitates reimbursement of transportation expenses to relatives, legal heirs, airline operators, cargo agencies, and recognised Gulf-based associations. Operationalised through structured eligibility norms and pre-approval mechanisms, the scheme has become a critical humanitarian pillar of NORKA's global welfare reach.

Social security schemes

The Government of Kerala has established an integrated social protection system for its diaspora population through five primary mechanisms, addressing documentation, health security, legal assistance, and grievance redressal. At the centre of this framework is the Non-Resident Keralites Welfare Board (NRKWB), which has operated under NORKA since 2009 and has played a key role in implementing welfare schemes throughout the 13th (2017–22) and 14th (2022–27) Five-Year Plans. Between 2016 and 2025, the Board enrolled 6,84,572 new members in its Welfare Fund, highlighting its extensive outreach. The Pravasi Pension Scheme, its flagship initiative, disbursed Rs 813.65 crore to 72,112 beneficiaries, while the Pravasi Dividend Scheme mobilised Rs 330.4 crore in NRI investments for infrastructure development. These efforts reflect alignment with Kerala's development strategy across two planning periods.

The Board's social security portfolio included Rs 9.6 crore in death assistance, Rs 9.1 crore for medical aid, Rs 24.1 lakh in educational grants (190 beneficiaries), and Rs 5.2 crore for marriage assistance (870 beneficiaries). These interventions were strategically implemented to support Kerala's social development objectives, particularly focusing on migrant welfare and financial security for NRK families.

To enhance access and representation, the NRK ID Card system was introduced as a multi-purpose biometric identification document. With representation across 182 countries, the card has registered 6 lakh NRKs to date. Since its 2021 launch, 49,200 migrants have enrolled in the accompanying Pravasi Raksha Insurance Policy, gaining access to accidental death coverage (Rs 5 lakh), disability compensation (Rs 2 lakh), and repatriation assistance (Rs 50,000 for overseas deaths, Rs 30,000 within India). The ID card anchors access to the broader NORKA welfare ecosystem and marks a significant step in building foundational identity infrastructure for the diaspora.

The Pravasi Raksha Insurance Policy, also launched in 2021, emphasises Kerala's innovative approach to portable health security for its migrants. The voluntary scheme, open to individuals aged 18–60, offers an annual coverage of Rs 1 lakh for critical illnesses, Rs 3 lakh for accidental death, and up to Rs 1 lakh for permanent or partial disability, at an affordable premium of Rs 661. The scheme's digital enrolment and actuarial design reflect attention to the practical needs of mobile workers.

For legal protection, the Pravasi Legal Aid Cell (PLAC) institutionalises transnational support with a Rs 60 lakh budget for 2025–26. Operating through seven legal consultants stationed across GCC countries, PLAC provides end-to-end legal services from case filing to courtroom representation, especially in labour disputes. It also undertakes preventive awareness programmes, reinforcing legal literacy among migrants.

Serving as the technological backbone of this welfare architecture is the Global Contact Centre (GCC), a Rs 1 crore initiative that offers 24/7 multilingual support through toll-free numbers (1800 425 3939 in India, +91 8802 012345 internationally), and digital platforms. The GCC handles a wide range of queries including documentation, scheme eligibility, and emergency support, while also functioning as a data intelligence hub for policy recalibration.

Another critical arm of this structure is the NRI (K) Commission, established by NORKA in 2015 as a quasi-judicial forum to address the specific grievances of Non-Resident Keralites. It handles petitions related to threats to life and property, tracing of missing persons, compensation disputes, and recruitment frauds, playing a vital role in safeguarding NRK rights. With an annual caseload of approximately 500, the Commission conducts District-level adalaths (public grievance redressal meetings) to ensure accessible and timely justice.

NORKA has also launched a comprehensive health and insurance policy, Norka Care, exclusively for Malayali expatriates with effect from 2025. The scheme is expected to benefit 20 lakh malayalis living abroad.

Migration facilitation schemes and services

The organisation offers a comprehensive range of migration-related services to support prospective and returning migrants throughout their employment journey, ensuring compliance with legal and ethical standards while enhancing their employability.

The Overseas Recruitment Wing, recognised by the Ministry of External Affairs (MEA), India, specialises in ethical, regulated overseas employment solutions. Established in 2015, it functions as a full-service provider for international staffing, maintaining an extensive database of skilled professionals across various industries. Demonstrating significant operational efficiency, the agency facilitated the migration of approximately 3,500 candidates to key destinations such as the UK, Kuwait, Saudi Arabia, and Germany. In the fiscal year 2024-25 alone, it recruited 1,065 individuals, with projections estimating 1,400 placements in 2025-26. By adhering to strict regulatory frameworks and prioritising transparency, the Overseas Recruitment Wing safeguards migrant workers from exploitation while meeting international labour market demands.

As part of this wing, the NORKA Mobility Migration platform is being developed specifically for healthcare professionals. It facilitates migration through strategic partnerships with Governments and employers in high-demand regions, including the Gulf Cooperation Council (GCC) countries, Germany, and the United Kingdom. Key initiatives under this platform include the Triple Win Project in Germany, which addresses skilled labour shortages by recruiting qualified Indian professionals; NHS Partnerships in the UK and Wales, supplying healthcare workers to the National Health Service; and the Newfoundland and Labrador Project in Canada, targeting skilled workers for Atlantic Provinces.

NORKA is also the sole agency authorised by the Government of Kerala for document authentication, ensuring the legal validity of educational and professional certificates for international use. Operating in compliance with Ministry of Human Resources Development (MHRD) guidelines, it facilitates attestation through centres in Thiruvananthapuram, Ernakulam, and Kozhikode. Its key services include embassy attestation for countries such as the UAE, Saudi Arabia, Kuwait, Bahrain, and Qatar; visa stamping for Kuwait and Saudi Arabia; and apostille services for 108 Hague Convention member countries. With an annual processing capacity of 50,000 certificates, this service eliminates bureaucratic barriers, enabling seamless document verification for employment, education, and residency abroad.

The Pre-Departure Orientation Programme (PDOP) prepares prospective migrants by familiarising

them with the legal, cultural, and professional environments of their destination countries. This training reduces post-migration challenges and vulnerabilities related to exploitation or contractual disputes. Complementing PDOP, NORKA offers skill upgradation programmes aimed at addressing evolving global job market demands through targeted training for both aspiring and returning migrants. The programme includes language training through the Norka Institute of Foreign Languages (NIFL), offering courses such as IELTS, CET, Japanese, and German. It ensures inclusive access by providing free training to SC/ST and Below Poverty Line (BPL) candidates, promoting equitable opportunities.

Alongside PDOP, NORKA launched the Norka Shubhayathra scheme to provide financial assistance to prospective migrants, easing travel-related expenses. This programme offers soft loans of up to Rs 2 lakh for costs such as airfare and visa fees, coupled with an interest subsidy of 4 per cent for borrowers who repay within one year and four months. The initiative aims to make overseas employment more affordable and accessible for aspiring Non-Resident Keralites.

For 2025-26, NORKA introduced two additional schemes focusing on migration facilitation, based on recommendations from the 4th Loka Kerala Sabha. The Skill Certification initiative, implemented in partnership with the Kerala Academy for Skills Excellence (KASE), certifies expatriates' skills to improve their employment prospects in India and abroad. Services are accessible via the Loka Keralam Online portal, which also offers direct links to a wide range of Central and Kerala government services tailored for expatriates. This consolidation ensures easy access and efficient service delivery.

The Student Migration Cell addresses the rising issue of student migration from Kerala by establishing a robust grievance redressal mechanism to systematically collect and resolve complaints. It features a comprehensive website offering pre-departure orientation materials and updates on relevant destination country legislation, equipping students with essential information.

Diaspora engagement and investment facilitation

Over the past nine years, diaspora engagement has become a foundational aspect of the NORKA Department's work, positively influencing all facets of its operations. A key platform for this engagement is the Loka Kerala Sabha, a democratic forum empowering migrants by incorporating their voices into policymaking. With representatives spanning 103 countries and 25 Indian States, the Sabha ensures global participation in Kerala's development.

Complementing this is Loka Keralam Online, the digital extension of the Sabha, providing a variety of services to Non-Resident Keralites (NRKs) registered on the portal. To bolster diaspora investment, the NORKA Department created Overseas Keralites Investment and Holding Ltd. (OKIH), a dedicated entity to facilitate and channel investments from overseas Keralites. Both Loka Keralam Online and OKIH stem from recommendations of various Loka Kerala Sabha meetings, reflecting the government's dedication to leveraging diaspora expertise and resources for Kerala's advancement.

Loka Kerala Sabha. Instituted by the Government of Kerala, the Loka Kerala Sabha (LKS) represents a pioneering effort to institutionalise democratic participation of the global Malayali diaspora. Established as a permanent, inclusive platform, LKS promotes socio-economic, political, and cultural integration between Kerala and its widespread non-resident population. It comprises elected representatives, nominated members from abroad and other Indian States, and representatives of return migrants, aiming to bridge geographic and emotional divides. Membership is primarily for Indian citizens, with Overseas Citizens of India (OCI) and Persons of Indian Origin (PIO) included as special invitees. The Sabha's design includes biennial meetings, a structured nomination process, and a dedicated secretariat, underscoring the State's commitment to sustained diaspora engagement.

Regional assemblies in the UAE, UK, and USA were innovative steps to increase participation from diaspora members unable to attend central meetings, enhancing inclusivity and providing additional policy influence. The Sabha also facilitated key developments such as the Loka Keralam Online portal, designed to build a real-time diaspora database and promote collaboration between the diaspora and the State, as well as the Kerala Migration Survey 2023, aimed at addressing migration data gaps.

The fourth Loka Kerala Sabha, held in June 2024, marked a notable expansion in scale and depth, with representation from 103 countries and 25 Indian States. Discussions focused on critical themes such as the Draft Emigration Bill, recruitment practices, reintegration, skilling, vulnerable migrants, developmental models, and the knowledge economy. A fifteen-member

evaluation committee reviewed recommendations and submitted viable proposals to the State government, while forwarding relevant central government suggestions. Beyond policy outputs, the LKS has cultivated a culture of transnational civic engagement, improved diaspora welfare programmes, and emerged as a unique model for diaspora-State partnership in democratic governance. The preparations for the fifth Loka Kerala Sabha scheduled to be held in early 2026 are in progress.

Loka Keralam online. Loka Keralam Online is a digital platform designed to unify the global Malayali diaspora and facilitate continuous engagement with the Government of Kerala during emergencies and daily life. Launched at the Loka Kerala Sabha session held at the Kerala Legislative Assembly in June, extensive outreach programmes are underway to promote the portal worldwide among Malayali expatriates.

The platform aims to enhance expatriate participation by offering various services, including online mental health support with assistance from the National Health Mission (NHM), providing free psychological counseling to registered users. It also features online Ayurveda consultations in partnership with the AYUSH Mission. Kerala Kalamandalam offers short-term online courses through the portal, targeting expatriates and their children, with courses comprising 10–15 hours of instruction.

Overseas Keralites Investment and Holding Ltd. (OKIH). OKIH empowers overseas Keralites to contribute to Kerala's development by initiating world-class projects and leveraging global expertise and technologies for local progress. It provides opportunities for NRIs to invest their talents and resources in the State's future, promoting investment opportunities, facilitating knowledge transfer, and fostering innovation.

A flagship initiative is the RestStop wayside amenities project, which offers a chain of premium wayside amenities to enhance travel experiences in Kerala. Construction of the first centre at Manjeswaram, Kasaragod District, on 5.5 acres is underway and expected to be operational by the end of 2025, with commitments from leading retail and service operators.

OKIH is also launching Sherpa, a dedicated investment facilitation platform to serve as a reliable single-source support system for NRIs and other investors. In collaboration with Local Self-Governments, Government agencies, financial institutions, and industry experts, Sherpa bridges gaps between investor expectations and local realities.

The comprehensive diaspora engagement and investment facilitation initiatives led by the NORKA Department exemplify Kerala's innovative and inclusive approach to harnessing the vast potential of its global Malayali community. By institutionalising democratic participation through the Loka Kerala Sabha, leveraging digital connectivity via Loka Keralam Online, and promoting targeted investments through OKIH and its platforms, the State has created a robust ecosystem that strengthens the bond between expatriates and their homeland.

Challenges in Kerala's Migration Governance and Future Directions

Kerala, as one of India's largest migrant-origin States, has pioneered progressive diaspora engagement through initiatives like the NORKA Department and Loka Kerala Sabha. However, the State faces significant structural and operational challenges in migration governance that limit its ability to address the evolving needs of Non-Resident Keralites (NRKs). These issues underscore the urgent need for policy reforms, inter-governmental collaboration, and enhanced resource allocation to ensure safe, sustainable, and equitable migration for Kerala's diaspora.

The Government of Kerala, primarily through the NORKA Department, has made commendable efforts to support international migrants. However, it lacks direct involvement in national-level migration policy-making. This exclusion creates an asymmetry where critical State-level insights are not integrated into national strategies. Given that States are at the frontline of managing migration-related issues, their inclusion in national deliberations is essential for informed and comprehensive policymaking.

Kerala faces challenges in maintaining an accurate and updated database of NRKs due to its limited access to comprehensive migration data held by the Government of India. This restricts the State's ability to develop informed policies. Real-time data access would enhance day-to-day decision-making and enable the design of better-targeted interventions for both emigrants and returnees.

The Kerala Migration Survey (2023) reports a surge in return migrants, estimated at 18 lakh compared to 12 lakh in 2018. This increase, driven by global crises, economic disruptions, and stricter immigration laws, presents reintegration challenges, particularly in Kerala's service-sector-heavy economy. Although Kerala is the only Indian State with economic reintegration

programmes, existing schemes offer limited support relative to the scale of return.

Kerala has seen a rise in irregular recruitment practices, often facilitated by unauthorised agents such as travel agencies, educational consultancies, and online platforms. Many young migrants are duped into paying high fees for false job promises. While a national regulatory framework exists, it lacks enforcement strength. Loopholes in visa regimes further enable exploitation. Stronger State regulations and more proactive central interventions are needed to tackle illegal recruitment.

Student migration is rapidly increasing, with students comprising about 12 per cent of all emigrants according to KMS 2023. Many are misled by unregulated educational consultancies that charge exorbitant fees. These consultancies are often registered only under the Shop and Establishment Act, offering minimal accountability. Tighter regulations and better monitoring systems are needed to protect student migrants.

Coordination between Kerala and Indian Missions abroad remains inadequate. The Ministry of External Affairs (MEA) lacks a streamlined mechanism to engage with State Governments. Missions often do not respond promptly to State-level diaspora issues due to the absence of designated contact officers. Additionally, embassies lack staff familiar with regional languages like Malayalam. Establishing standard protocols and appointing State-specific liaisons within missions is essential for better service delivery.

NORKA and its operational arm, NORKA-Roots, face capacity shortages. Fewer than 100 staff manage operations across Kerala and four Indian States, implementing and monitoring nearly 20 Government schemes. The recruitment division, in particular, requires scaling up to effectively ensure safe and legal migration. Expanding human resources, investing in staff training, and integrating technology are essential for fulfilling NORKA's mission efficiently.

Emigration: Policy Directions for the Next Phase

Kerala's migration profile is undergoing significant transformation, marked by rising return migration, increased student mobility, evolving skill demands in destination countries, and growing expectations of institutional support. Addressing these second-generation migration challenges requires a coordinated, system-oriented policy approach that strengthens State capacity while engaging constructively with national institutions.

Government policy will continue to enable return migrants to productively reintegrate into Kerala's economy while leveraging their overseas experience and skills. In response to the rapid growth of overseas student migration and the proliferation of unregulated education recruitment agencies, the State will strengthen regulatory oversight to protect students. A dedicated regulatory authority should be considered that ensures transparent dissemination of information on foreign education pathways, regulates recruitment intermediaries, and provides students and families with reliable guidance on educational quality, costs, employment prospects, and legal safeguards.

To support evidence-based policymaking and emergency response, the Government must prioritise the development of a real-time, dynamic database of emigrants. The Loka Keralam Online platform should be strengthened through a sustained awareness and outreach campaign, incentivising voluntary registration by migrants. Collaboration with pravasi associations worldwide will help ensure wide coverage. The database can be a core policy tool for planning, welfare delivery, crisis management, and programme evaluation.

The State should continue to align skilling initiatives with national and global labour market demand, for instance, in fields such as manufacturing, hospitality, construction, logistics, information technology, and healthcare.

Given the limited formal role of States in migration governance, State Governments should argue for the establishment of a permanent national coordination mechanism involving State Governments. Such a platform would enable regular dialogue on migration policy, labour agreements, skilling standards, ethical recruitment, and migrant welfare. Kerala's experience through the NORKA model can be leveraged to contribute meaningfully to national policy design and implementation.

To strengthen migrant protection abroad, the Union Government should work closely with State Governments to establish structured grievance redressal mechanisms to ensure timely and equitable resolution of migrant grievances.

By investing in reintegration systems, regulatory oversight, data infrastructure, global skilling, and institutional coordination with the Union Government, the State will be better equipped to manage the evolving dynamics of international migration while safeguarding the interests and wellbeing of its emigrants.

Chapter 24

Human Resources: Unleashing the Potential

The Government of Kerala has protected and advanced workers' rights at a time when workers' rights are under attack worldwide. With respect to forming unions, worker cooperatives, welfare boards and pension schemes, workplace inclusivity measures for women and for vulnerable communities, and the protection of migrant rights, the State has evolved as a role model in the world of work. Public policy aims to ensure that workers in Kerala, including migrant workers, benefit from fair wages, improved welfare measures, higher standards of living, and access to decent work.

The Government of Kerala is further reinforcing labour regulation through legislative measures focused on strengthening the enforcement of wage laws, increasing penalties for non-compliance, and advancing reforms that promote workplace equality, safety, maternity protection, and equitable industrial relations.

Demographic shifts and trends — India and Kerala

Kerala's labour market reflects changes in demographics, investments in human capital (education and health), an extensive social security system, and inclusive strategies for interstate migrants. Kerala has achieved a significant demographic transition, moving from a phase of high birth and death rates to one characterised by low rates for both. A notable reduction in fertility and birth rates began in the mid-20th century. Compared to the rest of India, the decline in fertility in Kerala has been considerably more rapid. In 1981, individuals aged 15 to 59, commonly considered the working-age population, made up 57.5 per cent of Kerala's total population and 53.9 per cent of India's. Over the following two decades, Kerala experienced a significant rise in the share of its working-age population. By 2001, this group accounted for 63.4 per cent of State's total population, while that of the national average stood at 57 per cent.[1]

After 2001, the growth rate of Kerala's working-age population began to slow. Between 2001 and 2011, the proportion of the working-age population to the total population rose only slightly in Kerala: from 63.4 per cent to 63.9 per cent. In comparison, this proportion increased significantly in India as a whole, from 57 per cent to 60.3 per cent, a rise of 3.3 percentage points. This suggests that Kerala may have already passed the peak phase of its demographic dividend, with limited further gains possible.

[1] Thomas and Jayesh (2019)

According to Census 2011, there are nearly 10.4 crore elderly persons (aged 60 years or above) in India, of which 5.3 crore are women and 5.1 crore are men. The percentage of the population in the age group 60 years and above of the total population was 8.6 per cent in India, and 12.6 per cent in Kerala. Amongst South Asian countries, the pace of ageing in India is moderate, with the proportion of the aged projected to increase to 10.1 per cent in 2021 and 13.1 per cent in 2031. The corresponding figures for Kerala are 16.5 per cent and 20.9 per cent, respectively. The total population of the elderly aged 60 and above in Kerala is projected to be 84 lakh in 2036.[2]

The Elderly in India Report 2021 reveals that between 2011 and 2021, while the overall population grew by 12.4 per cent, the elderly population grew at a much faster rate of 36 per cent. Going forward, the annual growth rate of the elderly population is expected to be 3.3 per cent at the national level and even higher in Kerala, at 4 per cent.

Labour force participation rates

The labour force participation rate (LFPR) reflects the share of the population that is economically active, which includes both those who are employed and those who are seeking employment. There has been a significant improvement in Kerala's labour market with respect to the creation of new jobs. Periodic Labour Force Survey (PLFS) states Kerala's Labour Force Participation Rate (LFPR) increased by 9.7 percentage points between 2017-18 and 2023-24, showing strong workforce engagement. LFPR has increased for all segments (male, female, rural, urban), but the highest increase was among rural women. (Table 24.2)

The LFPR of rural females aged 15 and above increased sharply in Kerala, from 25.9 per cent in 2017-18 to 44.2 per cent in 2023-24 (up by 18.3 percentage points), indicating a major improvement in rural women's participation in the State. The corresponding national increase was even larger, from 24.6 per cent in 2017-18 to 47.6 per cent in 2023-24 (an increase of 23 percentage points). However, it may be noted that a significant part of the recent increase in LFPR among

[2] India Ageing Report 2023; Elderly in India Report 2021; Population Projections for Indian States 2011-2036, Report of the Technical Group on Population Projections, 2020, Office of the Registrar General of India (RGI), Economic Review, 2024 (GoK).

Table 24.1 *Proportion of population in different age groups, Kerala and India, 1971 to 2031* in per cent

	Age groups				
Kerala	0-14	15-29	30-59	60+	Total
1971	40.3	26.8	26.7	6.2	100.0
1981	35	30.3	27.2	7.5	100
1991	29.7	30.2	31	8.8	100
2001	26.1	27.5	35.9	10.5	100
2011	23.4	23.6	40.3	12.6	100
2021	20.4	22.1	41.0	16.5	100
2031	18.4	20.0	40.7	20.9	100
India					
1971	42.0	24.0	28.0	6.0	100
1981	39.5	25.9	28	6.5	100
1991	37.2	26.6	28.9	6.8	100
2001	35.3	26.6	30.4	7.4	100
2011	30.8	27.5	32.8	8.6	100
2021	25.7	27.3	37.0	10.1	100
2031	21.9	24.1	40.9	13.1	100

Source: Census of India, various years (Thomas and Jayesh 2019) and for population estimates 2021 and 2031, Population Projections for Indian States 2011-2036, Report of the Technical Group on Population Projections, 2020.

rural women at the national level is due to an expansion in the number of women reporting their activity status as unpaid helpers in agriculture.

In contrast, in Kerala, the shift of women's employment is mainly qualitative rather than quantitative. Although, compared to the national level, the increase in rural female labour force participation rate in Kerala was lower, the State started with a higher rate. More importantly, the new jobs created for women in the State are in salaried and skilled sectors such as health, education and IT services, rather than as unpaid helpers or casual workers. It underscores the importance of creating more suitable formal employment opportunities for educated rural women, especially in rural regions, in Kerala. At the same time, it is to be noted that, though there are ample efforts rendered by the National Statistics Office (NSO), the periodic labour force survey tends to underestimate women's work and labour force participation both in Kerala and at the national level.

In 2023-24, workforce participation rates (WPRs) or workers as a proportion of population (aged 15 years and above) were 71.8 per cent and 70.4 per cent respectively among men in rural and urban areas of Kerala. These proportions were lower than corresponding proportions among men in rural and urban areas at the national level to the range of two to six percentage points. In the case of women (aged 15 years and above), workforce participation rates in Kerala were significantly below the national average in rural areas (7.7 percentage points) but markedly above the national average in urban areas (7 percentage points) (PLFS 2023-24).

Between 2017–18 and 2023–24, Kerala's rural female WPR rose sharply, driven by a mix of policy, economic, and social changes. The Government's concerted efforts towards effective implementation of MGNREGA and women-friendly public works offered regular wage opportunities, while Kudumbashree's expanded activities promoted self-employment in agriculture, micro-enterprises, and services.

An important feature of Kerala's labour market is that the proportion of workers in regular employment is significantly higher in the State than the national average, especially in rural areas and among women. In 2023-24, the proportion of regular employees among

Table 24.2 *Labour force participation rates (UPSS) for persons aged 15 and above in Kerala and India, 2017-18 to 2023-24*

	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	Change in LFPR between 2017- 18 and 2023-24
Rural male								
Kerala	71.1	71.0	73.6	75.7	75.2	76.2	75.3	4.2
India	76.4	76.4	77.9	78.1	78.2	80.2	80.2	3.8
Rural female								
Kerala	25.9	31.3	35.1	35.4	40.4	40.8	44.2	18.3
India	24.6	26.4	33.0	36.5	36.6	41.5	47.6	23.0
Urban male								
Kerala	68.9	71.4	69.8	68.5	71.6	70.8	73.5	4.6
India	74.5	73.7	74.6	74.6	74.7	74.5	75.6	1.1
Urban female								
Kerala	27.3	29.7	28.6	30.6	33.5	33.6	37.0	9.7
India	20.4	20.4	23.3	23.2	23.8	25.4	28.0	7.6
All persons								
Kerala	46.5	49.3	50.3	51.3	54.0	54.3	56.2	9.7
India	49.8	50.2	53.5	54.9	55.2	57.9	60.1	10.3

Source: Periodic Labour Force Survey, 2017-18 to 2023-24

rural female workers was 33.5 per cent in Kerala compared to 7.8 per cent in India as a whole. Among urban males, however, the proportion of workers in regular employment is lower in Kerala than at the national level.

On the other hand, the proportion of workers who are self-employed is lower in Kerala than at the national level. The self-employed comprises own-account workers, employers, and helpers in household enterprises. At the national level, unpaid helpers in agriculture and other household enterprises account for a significant share of the workforce, especially in rural areas. In 2023-24, this share was 42.3 per cent among rural females and 12.4 per cent among rural males (in India as a whole). The share of unpaid helpers in the workforce is much smaller in Kerala: 12.2 per cent among rural females and 1.1 per cent among rural males (in 2023-24).

A remarkable trend in Kerala's labour market is decasualisation, or a decline in the proportion of the workforce in casual or insecure jobs without social security. In Kerala, between 2017-18 and 2023-24, casual wage employment as a proportion of principal and subsidiary (PS+SS) workers (who are 15 years and above) declined from 29.3 per cent to 23.9 per cent. The corresponding figure in 2011-12 was 37 per cent (KDR, 2021). This positive change in the decline in casual workers is visible across all demographic groups in rural and urban areas, male and female categories, and is mainly due to increases in self- and regular-employment. A notable feature of this decasualisation trend is the increase in the share of self-employment, especially among rural females (Table 24.3).

In Kerala, the decline in the share of casual employment between 2017-18 and 2023-24 was compensated for by an increase in the share of regular employment among men and a rise in the share of self-employment among women. The proportion of urban male workers in regular employment increased from 31.3 per cent to 37.7 per cent in Kerala during this period. The proportion of rural female workers in Kerala who are own-account workers or entrepreneurs increased by 6.3 percentage points (from 21.3 per cent to 27.6 per cent).

The significant increase, after 2017-18, in self-employment among rural and urban women in Kerala points to the impact of the growth of small-scale and household-based informal enterprises on female employment.

In contrast to many other States, casualisation of labour is low in Kerala. It is attributed to multiple factors, such as a highly skilled workforce that may prefer self-owned ventures over daily wage work. The Left Front Government's commitment to increase the budget outlay on social security and welfare schemes, strong cooperative movements the revival of remittances from emigrants from Kerala, and the expansion of Kudumbashree activities into the service sectors could also be among the reasons for the growing decasualisation in the State.

The status of unemployment in Kerala

According to the PLFS data, there has been a significant reduction in unemployment rates (as per the usual principal and subsidiary status) in Kerala, both in rural and urban areas, especially between 2017-18 and 2023-24. The reduction in unemployment among urban females aged 15-29 has been particularly marked. The urban female (aged 15 and above) unemployment rate declined from 27.4 per cent to 10.9 per cent between 2017-18 and 2023-24. During the same period, among urban females in 15-29 age group, the unemployment rate declined from 65.2 per cent to 37 per cent (a reduction of 28.2 percentage points). The corresponding decline in India's urban female unemployment was much smaller, from 27.2 per cent in 2017-18 to 20.1 per cent in 2023-24, a decline of only 7.1 percentage points. Policies that promoted women's cooperatives in retail and services could have been a major driver of women's employment in Kerala in recent years. There is scope for further progress in developing sus tainable, socially inclusive platforms for women's employment.

Table 24.3 *Percentage distribution of workers in usual status (ps+ss) by broad status in employment in Kerala and India, 2017-18 and 2023-24*

Status of employment	Rural Males		Rural Females		Urban Males		Urban Females	
	Kerala	India	Kerala	India	Kerala	India	Kerala	India
	2017-18							
1. Self-employed	40.8	57.8	30.5	57.7	40.9	39.2	28.5	34.7
1a. Own account workers or employers	40.2	48	21.3	19	40	34.9	22.8	23.7
1b. Helpers in household enterprises	0.6	9.8	9.2	38.7	0.9	4.3	5.7	11
2. Regular employees	24.7	14	41.3	10.5	31.3	45.7	55.7	52.1
3. Casual labourers	34.6	28.2	28.2	31.8	27.8	15.1	15.8	13.1
4. All (1+2+3)	100	100	100	100	100	100	100	100
	2023-24							
1. Self-employed	44.7	59.4	39.8	73.5	42.3	39.8	33.5	42.3
1a. Own account workers or employers	43.6	47	27.6	31.2	40.9	35.1	25.5	28.5
1b. Helpers in household enterprises	1.1	12.4	12.2	42.3	1.4	4.7	8	13.8
2. Regular employees	25.7	15.8	33.5	7.8	37.7	46.8	51	49.4
3. Casual labourers	29.6	24.9	26.7	18.7	20	13.4	15.4	8.3
4. All (1+2+3)	100	100	100	100	100	100	100	100

Source: Periodic Labour Force Survey, 2017-18 to 2023-24

Table 24.4 *Sectoral shares in employment and output, 2017-18 to 2023-24*

Sector	Share in Employment (in %) Usual Status (ps+ss)		Share in GSDP (in %)		Relative productivity		Change in Employment share (in percentage points)	Change in GDP share (in percentage points)
	2017-18	2023-24	2017-18	2023-24	2017-18	2023-24		
Primary	20.1	27.3	9.5	8.3	0.5	0.3	7.2	-1.2
Secondary	31.1	24.2	28.4	27	0.9	1.1	-6.9	-1.4
Tertiary	48.8	48.5	62.1	64.7	1.3	1.3	-0.3	2.6
All sectors	100	100	100	100	1	1	0.0	0

Source: Periodic Labour Force Survey, 2017-18 and 2023-24; GoK, 2025

Table 24.5 *Average daily wages and earnings of workers in Kerala and India, April-June, 2024.*

Category of workers		Rural			Urban			All		
		Male	Female	Persons	Male	Female	Persons	Male	Female	Persons
Regular wage labour	Kerala	659	568	621	913	745	841	800	666	743
	India	607	413	568	870	663	815	746	568	703
Casual wage labour	Kerala	884	454	807	932	505	883	903	469	836
	India	444	299	417	537	364	516	459	306	433
Self Employed	Kerala	625	264	558	665	264	588	641	264	570
	India	486	174	400	783	283	680	557	193	463

Source: Periodic Labour Force Survey, 2023-24

Sectoral distribution of employment and output

The sectoral distribution of employment and output in Kerala between 2017-18 and 2023-24 reveals a mixed pattern of structural transformation. The most striking trend is a partial reversal in structural transformation, with the primary sector's share in employment increasing from 20.1 per cent to 27.3 per cent, even as its share in GSDP declined from 9.5 per cent to 8.3 per cent. This divergence led to a sharp fall in the relative productivity of the primary sector from 0.5 to 0.3, pointing towards a re-agrarianisation of employment. This may be a Covid-related phenomenon.

In contrast, the secondary sector experienced a contraction in employment, with its share declining by nearly seven percentage points (from 31.1 per cent to 24.2 per cent), while its output contribution fell only marginally (from 28.4 per cent to 27 per cent). As a result, relative productivity in this sector improved from 0.9 to 1.1, suggesting efficiency gains through technological change, capital intensification, or shifts towards higher-value segments (Rodrik, 2016).

The tertiary sector remained the largest contributor to GSDP, with its share rising from 62.1 per cent to 64.7 per cent, despite a marginal decline in employment share (from 48.8 per cent to 48.5 per cent). The rising gap between employment and output shares indicates that services are increasingly capital- and skill-intensive, limiting their capacity to absorb additional labour.

Wages in Kerala

A central feature of Kerala's labour market is that workers in the State have organised themselves in various sectors, aided by effective interventions by trade unions and the Government.[3] Due to workers' empowerment, an important characteristic of Kerala's labour market is the highest wage levels in the country

[3] Thomas and Jayesh (2019)

for informal workers, both in rural and urban areas, for male and female workers alike.

As per the PLFS, the average wage rate in Kerala has consistently been higher than the national average for all categories of workers. For example, the current daily wage earnings for casual workers in Kerala is higher than the corresponding national level by 99.1 per cent for rural males and by 51.8 per cent for rural females. Nevertheless, female wage rates are lower than male wages rates in Kerala as they are in the rest of India (Table 24.5). A very important feature of workers in casual and regular jobs in Kerala is that, in general, their earnings are higher than those of self-employed workers, both in rural and urban sectors.

Advancing employment in Kerala

In Kerala, while the broad focus on economic growth and the ease of doing business has generated employment, there have also been numerous direct programmes and policies which boosted skills and created jobs. Employment opportunities have been created through direct recruitment to Government services and public sector institutions, alongside a wide range of schemes that promote self-employment, skill development, and job placement. Industry-friendly policies and a strong startup ecosystem have encouraged the establishment of new industries and enterprises, contributing to sustained employment generation across sectors. Data from the Employment Department reflects steady and balanced growth in the organised sector employment in Kerala, covering both public and private sectors, along with consistent improvement in women's participation.

Skill development and placement programmes implemented by various agencies including ASAP, KASE, Polytechnics, ITIs, IHRD, and through programmes organised by Departments such as Scheduled Castes Development and Scheduled Tribes Development, have played a significant role in improving employability, particularly among disadvantaged and vulnerable groups. The Kerala Knowledge Economy Mission implemented by K-DISC has facilitated placements through direct recruitment, apprenticeships, and Kudumbashree-linked interventions. ODEPC and NORKA have played a key role in facilitating training and overseas placements. Over these years, Kudumbashree has emerged as a major driver of rural and women's skill development, as well as of self-employment. The newly launched Chief Minister's Connect to Work Scheme which supports young people with monthly stipends while they pursue upskilling, is a significant initiative.

Between 2022–23 and November 2025, Kerala implemented the Year of Enterprises initiatives (1.0, 2.0 and 3.0) to promote enterprise creation and employment generation, which resulted in the creation of a significant number of MSMEs, and therefore jobs. Nearly one-third of these new enterprises are owned by women.

The Kerala Public Service Commission continues to play a key role in facilitating transparent public sector recruitment in the State. KPSC accounted for more than half of all PSC appointments across India in 2024.

In addition, wage employment is supported through demand-driven programmes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and the Ayyankali Urban Employment Guarantee Scheme (AUEGS), which ensure income security while creating durable public assets. In addition, industry-friendly policies and a strong startup ecosystem facilitate the establishment of new industries and enterprises, thereby contributing to sustained employment generation across sectors.

Building a Skilled Labour Force

Amid a rapidly changing global world of future work driven by technology, green transitions, and economic shifts, Kerala's efforts to build a skilled workforce are crucial to ensuring decent work, productive employment, and inclusive growth. Kerala tops the SDG India Index 2023–24, showcasing strong progress in poverty reduction and employment preference. SDG 8, focused on inclusive growth and decent work, is especially relevant as Kerala's development is people-oriented. In order to sustain the human capital advantage, the State Government has initiated certain programmes.

Bridging skills for future Kerala

To equip Kerala's youth with globally competitive skills for employment both within India and overseas, the Government of Kerala established the Kerala Academy for Skills Excellence (KASE) a non-profit organisation designated as the State's central agency to oversee and coordinate all skill development initiatives to create a skilled workforce in Kerala. A major initiative by KASE is the establishment of Centres for Excellences (CoE) which provide leadership, educate on best practices, conduct research, support training for the trainers, and skill training for specific sectors. Currently, there are eight CoEs. KASE also conducts certain accredited courses. A few such CoE are the Occupational English Testing Centre at Angamali (OET), Multi-language learning Institute, Centre of Excellence in Capacity

Building in Renewable Energy, Nursing Institute for Career Advancement, and Enlighten Skill Programme for Oil and Rig (ESPOiR). The OET Testing centre has trained more than 12,000 students who wish to work in the health care profession.

District Skill Development Centres (DSDCs), formerly known as Kaushal Kendras, are an initiative of the Department of Labour and Skills aimed at expanding skill development opportunities for people from diverse backgrounds, including those in rural areas. As the designated State Skill Development Mission and State Skill Secretariat, KASE (Kerala Academy for Skills Excellence) is responsible for enhancing the State's skill ecosystem and has conceptualised the DSDCs accordingly.

Another initiative by KASE is the Indian Institute of Infrastructure and Construction (IIIC), which is designed to equip individuals across all levels of the construction and infrastructure workforce, from entry-level workers to supervisors and managers with essential employability skills. The Centre's primary objective is to prepare these individuals for immediate employment opportunities both within India and abroad. Additionally, it serves as a bridge between course-certified trainees of IIIC and prospective employers, facilitating effective job placement.

Additional Skills Acquisition Programme (ASAP)

ASAP Kerala has evolved into the State's main pipeline for skilling, up-skilling and re-skilling, reaching nearly 2.8 lakh so far — roughly one in every 125 Keralites of working age — while giving industry a steady supply of job-ready talent. The Additional Skill Acquisition Programme (ASAP), a key component of the State Skill Development Project (SSDP), was initiated in 2012 through a collaborative effort between the Departments of Higher Education and General Education. The courses offered by ASAP, over 150 across 19 contemporary sectors**,** are designed to align with industry needs and boost the employability of Kerala's youth. ASAP undertakes training through 16 Community Skill Parks and 126 Skill Development Centres instituted across Kerala. The main courses that are in high demand for students are typically in emerging technologies like animation, drone operation, AI/ML, AR/VR, and analytics, which help the graduates upskill and enable them to become an industry-ready workforce. These skill training programmes have been conducted at selected schools and colleges across Kerala.

Skill training programmes for Kudumbashree and SC/ST individuals

ASAP has partnered with the Kudumbashree mission, the Scheduled Caste Development Department, and the Scheduled Tribe Development Department, to give targeted training that addresses skill deficits.

In 2019, Acquiring Resilience and Identity through Sustainable Employment (ARISE), a State-wide Kudumbashree initiative, was launched to empower individuals (especially women) by imparting practical skills and supporting self-employment. The immediate objective of ARISE was to give skill training to 50,000 flood-affected families. ARISE offers 3 months of skill training in both technical and non-technical domains to women. Training is offered for plumbing, electrical work, masonry activities, and carpentry, among other skills, as well as in non-technical areas such as laundry, ironing, sales, housekeeping, data entry, day-care services, and agriculture-related services. The training is delivered through accredited Government ITI's, polytechnics, and partnered private agencies. Through ARISE training, a large section of Kerala women were placed across production, services, and trade activities. According to the report published by Kudumbasree in April 2025, there were 3,23,000 people employed through 1,63,458 micro enterprises, which include production units (69,484), services units (49,381 units), trade (35,465 units) and food processing (2685 units).

The Scheduled Caste and Scheduled Tribe Development departments provide skill-based training programmes for people from Scheduled Castes and Scheduled Tribes. Since 2020, training has been provided to over 10,000 persons in 135 courses. Over 3000 have been placed, with 22 placed abroad.

In collaboration with the Indian Institute of Infrastructure and Construction (IIIC), the Scheduled Tribe Development Department provided specialised skills to 130 candidates from Scheduled Tribes. In collaborating with Digital University, the Department has also sanctioned 60 candidates to be trained in digital skills.

Industrial Training Department (ITD) and Industrial Training Institutes

The Industrial Training Department (ITD) of Kerala is primarily dedicated to offering vocational and apprenticeship training to the youth of the State. To fulfil this mission, the Department conducts a wide range of both long-term and short-term training

programmes through various Industrial Training Institutes and Centres across Kerala. Additionally, it facilitates apprenticeship opportunities by registering eligible youth with different establishments within the State. The Department's mission is to impart quality skill training aligned with evolving industry needs, enhance employability, and promote entrepreneurship among the youth across the different social groups. It adheres to the National Council for Vocational Training (NCVT) and State Council for Vocational Training (SCVT) frameworks. The Government of Kerala operates 108 Industrial Training Institutes (of which 14 are women ITIs), one Advanced Vocational Training System, and 9 Related Instruction Centres, with a total capacity of around 33,000 seats (1st year and 2nd year), of which 30 per cent seats are reserved for women candidates. These institutions offer NSQF (National Skills Qualification Framework) training in over 70 engineering and non-engineering trades.

Protection of Labour Rights and Social Security for Workers

Kerala has a strong history of safeguarding labour rights and promoting active trade union participation in the economic production process. The Labour Department serves as the key Government agency responsible for maintaining harmonious industrial relations. With a workforce that spans formal and informal sectors, including a significant number of migrant and unorganised workers, the Department has adopted a rights-based approach to ensure fair wages, safe working conditions, and access to welfare benefits. The State has also been a pioneer in creating social security schemes that ensure pensions, healthcare, housing assistance, and education support for workers and their families, including migrant workers in the State.

The Labour Commissionerate, the executive wing of the Department of Labour, is responsible for maintaining a worker-friendly environment and ensuring that workers receive the benefits they are legally entitled to. The major functions of this entity are the enforcement of labour laws, promoting industrial relations, quasi-judicial functions, and the implementation of welfare schemes. The enforcement of regulations is carried out through District and regional-level officers and inspectors. A separate inspectorate is assigned to ensure the implementation of the Plantations Labour Act, 1951, along with other relevant laws governing the plantation sector. Additionally, special inspection squads are deployed to monitor and verify whether contributions are being properly made to centrally administered schemes such as the Employees' Provident Fund and the Employees' State Insurance, which apply to all factories and commercial establishments across the State

Policy and legislation

To safeguard workers' rights such as weekly rest days, overtime pay, minimum wages, seating arrangements, and other entitlements, the State conducts special inspection drives at the State level and forms squads for District-level inspections. Additionally, the Wage Protection System (WPS) has been implemented to uphold wage transparency and ensure that workers in the unorganised sector receive at least the minimum wage. Launched in 2015, the WPS is a flagship initiative of the Kerala Labour Department, designed to facilitate wage disbursal through bank accounts and to monitor these transactions, thereby guaranteeing that employees are paid not less than the legally mandated minimum wages.

Kerala has established a robust institutional framework for harmonious employer–employee relations through district-level networks and 11 Industrial Relations Committees (IRCs) covering key sectors such as transport, cashew, toddy, coir, private hospitals, textiles, plantations, and newspapers.

To address the absence of social security measures in informal sectors, Kerala has created 16 Welfare Fund Boards under the Labour Commissionerate. The evolution of the welfare funds, which channelises benefits including health care, housing loans, special allowances and some retirement benefits to the workers and their dependents, remains an important facet of Kerala's social history.

The Government of Kerala has introduced several progressive labour legislations to strengthen worker welfare and industrial harmony, including amendments to the Minimum Wages Act (2017), Kerala Shops and Commercial Establishments Act (2018), and Maternity Benefit Act (2017), alongside provisions for e-payment of wages and improved working conditions for women employees. These reforms, highlighted in the Kerala Development Report 2021, aim to ensure fair wages, gender-sensitive workplaces, and streamlined compliance mechanisms to promote decent work and inclusive growth.

Support for workers

Kerala provides a multi-layered support ecosystem for workers, especially in the informal sector. The Government has built a comprehensive worker support ecosystem, especially for the informal sector, through

pensions, health insurance (Rashtriya Swasthya Bhima Yojana, RSBY and Comprehensive Health Insurance Scheme, CHIS), financial relief funds, and education/training programs. Targeted schemes like the Agricultural Workers Pension, Tree Climbers Welfare Scheme, and Aam Admi Bhima Yojana ensure social security, health coverage, and income support for vulnerable workers and their families.

Labour welfare: ESI and Welfare Fund Boards

The Employees' State Insurance (ESI) Scheme in Kerala is a key social security initiative providing medical care, cash benefits, and employment injury coverage to over 10 lakh workers and their dependents. Implemented through ESIC's regional and branch offices in collaboration with the State Government, the scheme operates an extensive network of 128 dispensaries, several hospitals, and the ESI Medical College at Parippally. Benefits include free medical treatment, maternity leave with full wages, sickness compensation, disability pensions, and dependents' support. Kerala has digitised ESI services, upgraded facilities, and strengthened grievance redressal to improve service delivery. Challenges such as information gaps, rural infrastructure limitations, and employer evasion are being addressed through awareness campaigns, inspections, and tighter enforcement to ensure comprehensive worker coverage.

Kerala Labour Welfare Fund Board (KLWFB) is a formal institutional framework to provide financial assistance to workers who are engaged in unorganised sectors and their family members with a view to upward mobility of the working class and create an egalitarian society. The Kerala Labour Welfare Fund Board (KLWFB), established under the 1975 Act, provides comprehensive social protection for informal workers and their families through schemes covering education, health, housing, and social security. Its initiatives include educational grants, skill-development programmes, maternity and marriage benefits, medical aid, accident compensation, and post-death assistance, thereby safeguarding households against income shocks. By combining welfare with human development measures, KLWFB promotes upward mobility and dignity for workers across their life cycle.

Government allocations to social security schemes for Kerala's informal workers have expanded significantly. Targeted schemes such as Saranya and Kaivalya show declining utilisation, but in aggregate, social protection programmes for unorganised sector workers have shown steady improvement, suggesting better awareness and administrative focus. Strengthening delivery systems through digital monitoring, gender-sensitive designs, and inclusive outreach can help Kerala maximise impact

Table 24.6 *Social security expenditure for informal workers, 2016-17 to 2024-25* in Rs lakh

Name of the Scheme	2016-17	2017-18	2018-19	2019-20	2021-22	2022-23	2023-24	2024-25
Income support to workers in traditional sector activities	6,500	5,901	7,000	6,400	7,500	4,549	6,864	6,955
The unorganised workers social security scheme	5	5	50	50	50	50	10	0
Social protection for unorganised sector workers	0	456	4,87.2	482.9	442.6	710.2	781.2	544.3
Self-employment scheme for the registered unemployed widows/deserted/ divorced/ unmarried women and unwedded mother (SARANYA)	1,600	1,812	1,720	1,820	1,682	1,324	989.4	699.5
Rehabilitation and welfare of differently abled registrants of employment (Kaivalya)	168	100	55	210	26.28	495	495	405.3
Total	8,273	8,274	9,312	8,963	9,701	7,128	9,139	8,604

Source: Department of Labour and Skill Development

and set a model for integrating informal workers into social protection systems globally.

Migrant Workers and Kerala's Economy

Kerala hosts a significant number of interstate migrant workers, respectfully called "guest workers". While estimating the actual magnitude of India's interstate migrants is difficult as they are mostly circular migrants, studies reveal that the migrant labour force in Kerala is in the range of 25 to 30 lakh, constituting around 8-10 per cent of its population.[4] Despite their crucial role in construction, manufacturing, and other labour-intensive sectors, most migrants have limited education and engage in physically demanding work. This large inflow underscores Kerala's dependence on migrant labour and the need for policies to ensure their welfare and integration into the State's development framework.

Kerala's migrant population is highly mobile and often undercounted, making statistical estimation and social security provision challenging. Studies show a growing share of seasonal migration, particularly in construction and labour-intensive sectors, with migrants averaging 230 days of employment annually, split between Kerala and their home villages.[5] Since 2010, Kerala has introduced dedicated welfare schemes for migrant workers, including registration under the Kerala Building and Other Construction Workers Welfare Board and the AAWAZ health insurance programme. Despite initially low registration numbers, enrolment has grown significantly, with over 5.2 lakh migrant workers covered under AAWAZ, as of 2025.

Several factors contribute to Kerala's current status as the favoured point of destination for interstate migrants. Three important reasons are worth mentioning. First, the demographic shift and the change in fertility rates resulted in a shrinking of the domestic pool of labour in he State. The TFR has fallen well below the replacement level since then. Kerala is also the State with the highest proportion of elderly people. Thus, Kerala's demand for workers is being met by interstate migrants. Kerala's migration corridor is becoming more attractive with the higher wages on offer— Rs 893.6 as against an all-India average wage rate of 417.3 (RBI 2024). Depending on the kind of jobs undertaken, the daily wage rate may even go up to Rs 1,250. This drives migration from low wage States.

Kerala has adopted a comprehensive approach to migrant worker welfare through multiple initiatives addressing housing, health, education, and social integration. The Apna Ghar scheme provides dormitory-style accommodation with modern amenities, while the AAWAZ programme offers health and accident insurance, covering over 5.2 lakh workers. Awareness campaigns and medical camps further promote health and labour rights. The Changathi literacy programme and the textbook Hamari Malayalam aim to teach language, rights, and social values, fostering inclusion. During the Covid-19 crisis, Kerala sheltered over 4.3 lakh workers in 21,556 camps, ensured food through Kudumbashree kitchens, and facilitated safe return via special trains. Going forward, the Athidhi Portal will digitally register and manage migrant workers, linking them to welfare schemes, healthcare, and skill development opportunities, strengthening Kerala's inclusive and rights-based migrant governance model.

Way Forward

The Government of Kerala affirms that labour rights are an inalienable component of the broader struggle for economic and social justice and are central to the progress of society as a whole. The rights of workers, recognised as fundamental rights under the Constitution, remain the cornerstone of Kerala's labour policy framework. The State takes pride in its long-standing tradition of inclusiveness and its secular and democratic approach to labour and the world of work, guided by the principle that no individual should be left behind in the pursuit of economic development.

Rapid transformations in global labour markets are reshaping the nature of work, underscoring the critical importance of continuous upskilling, reskilling, and industry-relevant training. While Kerala currently invests approximately Rs 300 crore annually in skill development initiatives, the presence of fragmented programmes has led to overlaps and inefficiencies, highlighting the need for greater convergence and coordination. The establishment of a centralised framework under the Labour and Skills Department and the State Skill Development Mission marks an important step forward. Going ahead, there is a strong case for strengthening decentralised, data-driven, and locally responsive skill delivery mechanisms through Local Self-Governments to ensure greater relevance and impact.

Building a future-ready workforce will require sustained strengthening of the Labour and Skills Department, deeper public–private partnerships, and closer alignment of training programmes with evolving industry demands. These efforts will enable Kerala

4 Narayana and Venkiteswaran, 2013; Thomans and Jayesh, 2019; GOK 2016; Parida and Raman, 2020; Raman 2012; Jayesh, 2025, Raman 2025

5 Parida and Raman, 2020; Jayesh, 2020

to consolidate its position as a leader in inclusive, sustainable, and globally competitive growth.

The State possesses significant employment potential across a range of sectors, including IT-enabled services, transport and logistics, banking and insurance, construction, healthcare and medical equipment, food processing, and tourism and hospitality. In this context, reskilling and upskilling initiatives must extend beyond improving employability to serve as instruments of empowerment and social transformation. Special emphasis should be placed on specialised training in emerging sectors, with focused outreach to women and to young men and women from Scheduled Castes and Scheduled Tribes, thereby advancing equity and social inclusion.

The Government of Kerala reiterates the importance of safeguarding labour rights while examining and addressing the challenges arising from the new legislative framework of the four new Labour Codes formulated by the Government of India. Looking ahead, the State remains committed to ensuring industrial peace and harmony as a means to enhance productivity, protect workers' rights, and promote a transparent and progressive work culture. The Labour Department will continue to prioritise constructive engagement between employers and employees, while strengthening awareness among workers not only of their rights, but also of their responsibilities, in the collective pursuit of fair and balanced industrial relations.

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Chapter 25
Arts and Culture

Over the previous ten years, the Government of Kerala has given practical shape to its commitment to support progressive, democratic, plural, and secular cultural values and institutions and a vibrant ecosystem for the arts in the State. It has created and improved public cultural services for the people. It is a measure of the commitment of the Government of Kerala to its rich cultural heritage that, in the Annual Plan of 2026-27, there is a 30 per cent year-on-year increase in the allocation to culture, museums, archaeology, heritage, tourism, and related fields.

A special feature of Kerala's cultural life and art forms is their ability to absorb and reflect the progressive values of the State's social and political movements and socio-economic change.

Cultural events in the State that are now known in India and internationally include the International Film Festival of Kerala (IFFK), International Documentary and Short Film Festival of Kerala (IDSFFK), International Theatre Festival of Kerala (ITFoK), and the Kochi-Muziris Biennale. The 13th and 14th and Fourteenth Five-Year Plans created and provided continued support to training programmes in different cultural spheres, integrated programmes of cultural development and tourism, and schemes and facilities to protect the livelihoods and increase the incomes of artists. The Plans gave new support to film education, to public institutions connected with cinematic art. It created special schemes for women and Scheduled Caste and Tribe film-makers. The Plans have encouraged the promotion and development of Malayalam, within the State and among the diaspora and others.

The period after 2016 and until the present day has been a period of policy action to preserve and conserve monuments, cultural artefacts, and archaeological sites and remains in the State. With regard to museums, the Plans supported the development of new infrastructure and efforts to improve visitors' museum experiences. Government policy has been to use the most modern scientific techniques to conserve the rich cultural wealth of the State.

In short, the Government of Kerala recognises the role of art and culture in social cohesion and in fostering a democratic, secular, and progressive outlook that resists divisive tendencies. To this end, its initiatives promote secular and progressive values, sustain traditional art forms, support artists, encourage participation by women and marginalised communities, expand platforms for cultural exchange, and strengthen cultural institutions, galleries, and museums.

Accomplishments of the Directorate of Culture

The Directorate of Culture coordinates and regulates the activities of all art, literary, and cultural institutions operating under the Department of Cultural Affairs. This includes various autonomous institutions, including Kalamandalam Deemed University, Sangeetha Nataka Academy, Sahithya Academy, Lalitha Kala Academy, Folklore Academy, Mahakavi Moyin Kutty Vaidyar Mappila Kala Academy, KSFDC, and Chalachithra Academy.

The Directorate, in addition to its primary coordinating role, supervises the distribution of annual grants to cultural institutions that do not receive direct State Plan assistance. It also undertakes responsibilities such as fostering and supporting creative activities within memorials dedicated to prominent artistic, literary, and cultural personalities. The Directorate further provides financial assistance to artists facing economic hardship and manages the distribution of monthly pensions to the dependents of renowned artists and writers. It also coordinates the programmes and initiatives of the South Zone Cultural Centre.

A major initiative of the Department of Cultural Affairs, coordinated by the Directorate, is the construction of the proposed cultural complexes in the State. This large-scale project is being implemented with substantial financial support from the Kerala Infrastructure Investment Fund Board (KIIFB). The Cultural Department's scheme provided non-recurring grants to 18 cultural organisations and associations with the objective of strengthening their activities and encouraging them to undertake creative initiatives. As stipulated in the scheme's provisions, an organisation was eligible to receive financial assistance three times within a five-year period. Since 2017, a total amount of Rs 5 crore has been provided in the budget to 18 institutions for cultural activities.

Livelihood support to artists

The livelihood security of those who make a living out of art and cultural activities was a matter of great concern to the Government. Artists and craftsmen were among the most adversely affected groups during the

pandemic and afterwards. Since 2017, the Government of Kerala has initiated several innovative programmes to provide financial assistance to artists and craftsmen, as well as opportunities for performance. They have also been included in social security schemes. During the Covid-19 pandemic, the Government focused on providing relief to artists in distress.

The Diamond Jubilee Fellowship Scheme, which supported thousands of young artists, was widely regarded as a successful initiative aimed at promoting talented young people and introducing the public to various art forms. Under the scheme, young artists with qualifications in fine arts and proficiency in folk arts were provided with a platform to train the public, and they received fellowships for a fixed period. The project was implemented with the active participation of Local Self-Governments (LSGs). A total of 1,000 young artists were selected as trainers, to offer instruction in 45 different art forms. The programme was operated through more than one thousand training centres across 171 LSGs, including Municipal Corporations, Municipalities, and Block Panchayats.

Each Fellow was given a monthly fellowship of Rs 10,000 by the State Government and an additional Rs 7,500 by the respective LSGs for a period of two years.

Similarly, Rural Art Hubs is an initiative aimed at providing livelihood means to artists and craftsmen, has been a major step by the Government, which has proven quite successful. This project aimed to establish rural art hubs in collaboration with organisations such as UNESCO, enhancing the skills of folk artists and craftsmen to enable them to reach the global market and strengthen their livelihoods. With Vastuvidya Gurukulam and Folklore academy as the implementing agencies, the project has made a significant impact on the livelihoods of poor artisans. This programme was carefully nurtured in view of its immense scope for expansion into additional areas, encompassing a broader range of art forms.

Fellowships were awarded to artists with remarkable achievements in the fields of folk arts, classical arts, performing arts, and fine arts through the Directorate of Culture, selected from the list of eminent artists recommended by institutions such as the Sahitya Academy, Sangeetha Nataka Academy, Lalithakala Academy, Kerala Kalamandalam, Kerala State Chalachitra Academy, Mapilakala Academy, and the Folklore Academy, among others.

In addition to the above, emergency financial assistance of Rs 640 lakh, at a rate of Rs 1,000 per month for two months, was provided to 32,000 artists and allied workers who lost their livelihoods due to the Covid-19 pandemic. Artists who have been working in the arts sector for 10 consecutive years and have settled permanently in Kerala were selected for financial assistance. Along with this, Rs 290.5 lakh was disbursed from the Chief Minister's Distress Relief Fund at the rate of Rs 1,000 per person to 29,050 artists and allied workers who had not received other financial assistance.

The projects Mazhamizhi and Thalirmizhi were `implemented to provide assistance to the art community, which was suffering from the loss of livelihood due to the Covid-19 pandemic and floods in Kerala. During the financial year 2021-22, the Lalithakala Academy conducted Nira Keralam Camp II with the aim of providing financial support to artists during the Covid-19 pandemic. Artists from 14 Districts participated in the event. The academy provided each artist who participated in the camp with Rs 20,000, canvas, and colours.

Culture and progressive values

Samam Cultural Initiative for Gender Equality, initiated by the Department of Cultural Affairs, proposed to promote gender equality in all spheres of art and culture. Conceived as a collaborative programme involving the Youth Welfare Board, Youth Commission, National Service Scheme, Scouts and other institutions working under the Department of Cultural Affairs, it received wide acclaim for its innovative artistic ways of creating awareness on gender issues among the people.

The Government initiated an exclusive programme, "diffusion of culture", to disseminate the unique culture and heritage of the State, creating opportunities for future generations to experience, appreciate, and enjoy various art forms, become acquainted with the literary tradition, and more. As part of this programme, promotional publications for the cultural institutions were prepared and the doyen of Malayalam literature, Shri. M T Vasudevan Nair was honoured.

In view of the diminishing public places and opportunities for cultural activities, Nattarangu was initiated to provide facilities to conduct cultural programmes in rural areas and remote places. This programme would help set up a small stage, green room, garden benches, and solar lighting, with the help

of LSGs, ensuring the upkeep of these facilities. This has provided numerous opportunities for art clubs and amateur groups to perform at various locations across the State.

Mazha Mizhi, an initiative by the Department of Cultural Affairs, in association with Bharath Bhavan, was launched to provide support to the art community that lost their livelihoods due to the Covid-19 pandemic and the flood. Thalirmizhi 2023, which encouraged the creativity of tribal artists and Kalamizhi, which brings together artists with disabilities, were organised as part of the scheme. The new scheme, Vasanthamizhi, has also been developed to promote the lives and contributions of the most talented people working behind all creative art forms, including Mudiyettu, Theyyam, Yakshagana, Padayani, tribal art forms, and classical art forms.

Promotion of the film and entertainment sector

The film sector received unprecedented stimulus during the period from 2017 to 2025, with several innovative programmes. Among them, the Kerala Film Market, launched by the Kerala State Chalachitra Academy (KSCA) in association with the Kerala State Film Development Corporation (KSFDC), offers innovative knowledge-sharing and commercial opportunities for film professionals, deserves special mention. The programme included B2B meetings, workshops, and masterclasses featuring renowned experts from India and abroad. Two editions of the Kerala Film Market have been organised as part of the International Film Festival of Kerala (IFFK).

Kerala Film Policy Conclave. The Government of Kerala conducted a Kerala Film Policy Conclave to formulate a comprehensive film policy for the State. The Conclave discussed various aspects of cinema involving representatives from 17 States, the National Film Development Corporation, relevant Government of India Ministries, various film organisations, and experts from the fields of Indian cinema, labour, and law. Consolidating the deliberations in the conclave, the Government aims to publish a draft of the film policy.

International Film Festival of Kerala (IFFK). The prestigious International Film Festival of Kerala (IFFK), established in 1996, has evolved into India's premier film festival, recognised globally over the years. The festival is held in November or December every year and is one of the largest cultural events organised by the Government of Kerala, hosted by the Kerala State Chalachithra Academy. The festival showcases the best films, renowned directors, technicians, and spectators from across the globe. Between 2017 and 2024, the number of films screened and the global representation have increased substantially. The festival has also introduced new segments to engage a wide range of stakeholders in the film industry. In 2025, the 30th IFFK was held, becoming nation's first ever film festival to reach 30 editions; 206 movies from 86 countries were screened at the festival.

Kerala State Film Development Corporation (KSFDC) has played a pivotal role in promoting the film industry in the State. Between 2017 and 2026, the Corporation provided subsidies for feature films and children's films produced under the Chitranjali package scheme, under which around 40-45 films are produced annually. KSFDC owns and operates 17 global-standard theatres spread across various parts of Kerala. The Corporation has completed the renovation of Kairali, Sree, and Nila Theatres in Thiruvananthapuram, the modernisation of Kairali, and Sree Theatres in Thrissur, the Cine Expo, the construction of vedi in the Public Auditorium, the construction of Sakhi Dormitory, and the construction of the Sree Narayana cultural complex at Kollam, cultural complexes at Kasaragod, and Palakkad. The modernisation of Chitranjali Studio, the construction of the theatre complexes at Alagappanagar, Kayamkulam, Vaikkom, and Payyannur, and the e-ticketing system are nearing completion.

KSFDC provided assistance to women and SC/ST directors for the production of feature films in Malayalam. As of now, eight films have been completed, and seven films have been released in theatres. Three films are at various stages of production, and four new films have been selected for assistance. This programme has received wide acclaim, as many budding filmmakers have been able to materialise their dreams, and some of the films produced under this scheme have been rewarded at film festivals.

C Space, an on-demand video streaming platform for content in Malayalam was launched by the KSFDC in 2021, marking the country's first Government-owned digital streaming service. This OTT platform, operating on a pay-per-view model, has the primary goal of promoting quality Malayalam films with artistic and cultural value, including independent films, documentaries, and short films. Half of this amount goes directly to the content providers, ensuring a fair and transparent revenue-sharing mechanism. This model diverges from traditional subscription-based

OTT platforms, offering both viewers and filmmakers a flexible and equitable way to engage with the content.

The Kerala State Chalachitra Academy, in addition to organising IFFK, operates the Centre for International Film Research and Archives (CIFRA) with a carefully assembled and impressive archive of over 12,000 films (including world cinema classics) and more than 1,000 vintage magazines, songbooks, posters, and memorabilia. These materials are preserved, digitised, and are soon to be displayed at a dedicated Malayalam Cinema Museum at CIFRA, serving both archival preservation and film research fellowships. It also produced the signature film for the Samam cultural awareness initiative, a festival supported by the Academy to promote gender equity through seminars, cultural processions, and film screenings in Kozhikode. The Academy also operates a library and archives to support activities such as collecting classics from Indian and world cinema, organising the exhibition of prints, and promoting research in audio-visual media. It conducted workshops for Visual Appreciation Camps for Children, a Teachers' Workshop on Film Appreciation, Film Appreciation Courses, seminars, training sessions, and exhibitions on cinema. It also organises the annual Kerala State Film Awards.

Promotion of Malayalam Literature and the Malayalam language

The institutions promoting the Malayalam language and literature have achieved notable success during the period from 2017-18 to 2025-26.

The Kerala Sahitya Academy, the most prominent agency promoting Malayalam literature, continued its activities, including book publishing, Malayalam literary surveys, and memorials to various Malayalam writers, digitisation, and commemoration of notable Malayalam writers. The academy, along with the Department of Culture, successfully organised the International Literary Festival (ILFK) for the first time, which had impressive public participation. The Academy also made progress in digitising rare books, periodicals, and documents that are on the verge of destruction by establishing a conservation lab. This lab utilises planetary scans and flatbed scanners that can scan up to 60 pages per hour without causing any damage.

The Malayalam Mission is an endeavour by the Government to promote the Malayalam language and culture among the children of non-resident Keralites. Currently, the Mission has centres in 70 countries and 24 States, with 121 chapters and over 85,000 students. The number of chapters, study centres, teachers and students has almost doubled from 2021 to 2025, from 58 to 121. The number of teachers rose from 4,394 to 7,061, the number of study centres increased from 2,173 to 3,178, and the number of students grew from 45,349 to 85,820. The Mission produced promotional films and videos to disseminate the importance of learning Malayalam. The Neelakurinji higher diploma course, offered by the Mission, was granted 10th standard equivalency, making it the first initiative by a State in India to administer the Class 10 language equivalency test for expatriates in their native language. The YouTube channel to disseminate the programmes of the Malayalam Mission has now reached an estimated 10 crore people. The Mission also developed the Bhoomi Malayalam Open Online Course (BOOMC), a project designed to teach Malayalam in Kendriya Vidyalayas in Kerala, providing students with the equivalent of Kerala's 10th standard language proficiency.

The Kerala Bhasha Institute continued its activities to make Malayalam a useful language for modern science and technology, to prepare textbooks for higher education, and to update the language to reflect contemporary usage. The Institute implemented schemes for the promotion, development, reform, and advancement of the Malayalam script and the publication of literature in other Indian languages written in the Malayalam script. Other publications include the English-Malayalam dictionary, the Kerala Sanskrit Vijnana dictionary, the English-Malayalam pronunciation dictionary, a grammar dictionary, and a public administration definitions dictionary, to promote language development. The Institute also introduced a new online web portal for marketing published books, an online dictionary, e-books, and audiobooks. Construction of the new headquarters of the institute was completed in 2023-24.

The State Institute of Encyclopaedic Publications made significant contributions during the last ten years by completing 19 volumes out of 20 envisaged volumes of the encyclopaedia. It is the only institute in India that exclusively publishes encyclopaedias, including the renowned Sarvavinjanakosham and the Encyclopaedia of Dravidian Culture. The institute also published 13 user-friendly mini encyclopaedias, in collaboration with higher education institutions in the State, setting a new model in this direction. They have also published audio versions of the encyclopaedia. The Institute also launched a YouTube channel, Arivu, which provides information based on seminars on various topics.

Preparation of online encyclopaedias is currently in progress.

The Kerala State Institute of Children's Literature, the only Government institution in India dedicated exclusively to publishing books for children, produced a wide range of Malayalam books and periodicals with the aim of ensuring that every child in Kerala had access to quality reading materials. The Institute publishes the renowned children's magazine Talir, which conducted annual reading competitions and awarded yearly scholarships to promote reading habits. It also organised training programmes and honoured writers and artists to encourage the growth of children's literature in Malayalam. The Institute conducted Sargavasantham summer camps to nurture creativity among children. It supported cultural initiatives by publishing books for the Muziris Heritage Project of the Department of Tourism. Additionally, efforts are underway to organise Taliru Reading Festivals at Village and District levels with active participation from Taliru scholarship recipients.

The Thunchan Memorial Trust, formed in 2001 in memory of Thunchath Ezhuthachan, the father of modern Malayalam, was recognised by the University of Calicut as a research centre. It continues to attract students, scholars, and language enthusiasts from across India. The Thunchan Literary Museum, depicting the development stages of Malayalam, has been renovated. Seminars and conventions featuring leading scholars, musicians, artists and dancers were organised. The annual Thunchan Fest, held every February, continued with increased participation, becoming a major cultural event that combined literature, art, and learning. The Vidyarambham Festival, where eminent writers and teachers initiate young children into learning, attracted more people during this period, marking the predominance of secular values in programmes related to language and culture.

The Kumaran Asan National Institute of Culture, a national-level cultural organisation dedicated to the memory of the legendary poet Kumaran Asan, has taken significant steps in collaboration with the State Archives Department to preserve the invaluable manuscripts of almost all the poet's works, diaries containing his reflections and English notes, and correspondence with various contemporaries. The mural museum showcasing the paintings based on Asan's major works, including Veenapoovu, Leela, Chinthavishtayaya Seetha, Chandalabhikshuki, Duravastha and Karuna was renovated. The publication division published authentic editions of his works, a biography, and a three-volume compilation of his essays sourced from various magazines. The Institute also expanded the reach of its publications and attracted a larger audience.

Vailoppilly Samskrithi Bhavan, a cultural institution dedicated to preserving and presenting Kerala's art forms and cultural heritage, conceived several innovative programmes. Mudra, a national dance festival that attracted artists from across India, was conducted with more participation and elan. The institution also organised seminars, literary camps, weekly cultural programmes and children's vacation camps such as Mambazhakkalam.

Mahakavi Moyinkutty Vaidyar Smarakam, also known as the Mahakavi Moyinkutty Vaidyar Mappila Arts Academy, established at Kondotty in memory of Mahakavi Moyinkutty Vaidyar (1852–1892), the legendary poet who made the greatest contribution to Mappilappattu, ran certificate courses in Mappilappattu and Mappila Kali. The Smarakam housed a folklore study centre, a reference library and a historical museum, offering valuable resources for learners and researchers. It also conducted the annual Vaidyar Mahotsavam to honour the poet's legacy and promote Mappila art traditions.

The Kerala Book Marketing Society served as the primary agency for selling Government publications, books, and journals from various cultural institutions. It adopted innovative ways of attracting the public to books and reading by publishing new titles and establishing a Book Cafe in Thiruvananthapuram. Book cafés are in progress in other parts of the State. They also organised numerous book exhibitions to enhance sales and readership.

Art, culture, theatre and performing arts

Major initiatives were launched by the Government to promote art, culture, theatre, and traditional performing arts from 2017-18 to 2025-26. They were primarily aimed at promoting talent, providing opportunities for artists, and integrating the art and theatre of Kerala with institutions and movements worldwide. The art institutions of Kerala have been consistently working to integrate the State's rich traditions in art and theatre with global practices, ensuring that local forms evolve in conversation with international trends. Through collaborations, cultural exchanges, artist residencies, and participation in global festivals, these institutions have tried to align their programmes with international standards. Such efforts not only helped artists understand global opportunities but also facilitated the

exchange of talent across borders, enabling Kerala's art and theatre ecosystem to engage meaningfully with the wider world. Major achievements of the art institutions in Kerala are given below.

Kerala Kalamandalam underwent a significant transformation in its outlook and operations during this period, through several programmes to modernise the infrastructure facilities and improve the academic environment. The construction of a new academic block, named the Manakkulam Mukundaraja Academic Block, consisting of 34 classrooms, was completed at the institution during the 2024-25 academic year. The construction of Vallathol Memorial Park's (first phase) Visitors' Lounge was also completed at the Institution. The Margazhi festival and Nila National Dance-Music Festival, initiated by the Kalamandalam, are acclaimed globally, attracting many art connoisseurs. The traditional courses on Kathakali, Mohiniyattom, Kutiyattam, Thullal, Chutti, Chamayam, Mrudangam, Mizhavu, Carnatic Music, and Instrumental Music (of Kerala) have been modernised. Additionally, performance by Kalamandalam troupes has significantly increased.

Kalamandalam has attempted to connect with the global audience and the community of art researchers by launching exchange programmes. This has attracted many researchers and artists from around the world to reside and learn at the institution.

To present the Kerala art forms of Kathakali, Koodiyattam, Mizhavil Pancharimelam, Ottanthul, Chakyarkoothu, and Nritha Sangamam (Mazhayoli) at the Colorado Festival, organised by the Colorado Fine Arts Society in America, short videos of these art forms from Kalamandalam Koothambalam were documented and exhibited. With a focus on encouraging women artists, the Centre for Nangyarkoothu was launched to support and promote women artists practising Koodiyattam.

The Kerala Lalitha Kala Academy strived to foster and develop various art forms, including painting, sculpture, photography, graphics, and cartooning. The art galleries at Thiruvananthapuram, Kilimanoor, Kayamkulam, Kottayam, Alappuzha, Ernakulam, Thrissur, Kaladi, Malampuzha, Malappuram, Kozhikode, Thalassery, Payyannur, Mananthavady, and Kanhangad have been maintained well and the Artist Residency Studio at the Raja Ravi Varma Memorial Cultural Centre in Kilimanoor offered artists a dedicated space to live and work. It also established Dhyan Chitra: A. Ramachandran Visual Cultural Lab at the Durbar Hall Art Centre in Ernakulam, a research facility and library honouring the late artist, Sri A Ramachandran. The Academy also facilitated the establishment of the A Ramachandran Art Gallery at the Sree Naryayana Guru Cultural Complex at Kollam, which houses his paintings and other works by the artist. The gallery displays a comprehensive collection, including paintings, sculptures, drawings, ceramics, and children's books, showcasing his diverse artistic career from his early expressionist period to his later nature-inspired works. The Academy also organised several symposia and workshops to reimagine the art ecosystem in Kerala. An international art exchange programme with Bangladesh was conducted. An exclusive programme to promote art education in colleges and universities has also been initiated. Consultations with internationally reputed artists and curators have been held to create a vibrant ecosystem for appreciating and commercialising the works of artists from Kerala.

The Kerala Sangeeta Nataka Academy has launched several initiatives to promote various forms of dance, music, drama, and folk arts from Kerala, with a primary focus on performance events, workshops, and regional festivals, as well as projects aimed at documenting and preserving rare, historically significant, and endangered art forms. Workshops and regional festivals have enabled a sizeable number of budding artists to improve their skills and get exposure to the works and trends of prominent artists and art movements. A digital archive has been established, and digital equipment has been purchased to record videos and documents related to various art forms. An artist data bank software to identify Kerala's performing art forms and register all artists above the age of 18 has been set up. A special academy font has also been developed. The Academy provided grants and scholarships to financially disadvantaged students and distributed awards annually to recognise outstanding talent in the field of the performing arts. Additionally, the Academy provided accidental insurance coverage to many artists. The International Theatre Festival of Kerala (ITFoK), the annual international theatre festival organised by the Academy, has now evolved into a prestigious event with representation from around the globe.

The Kerala Folklore Academy provided training in folk arts, fostering their continuous development, promotion, and preservation. The Academy's core mission to identify and classify the diverse folk art forms of Kerala and to expand their reach and influence among the wider public has been successful. The

Academy provided medical assistance to artists facing health issues and offered stipends to children who perform rare and disappearing folk art forms. Folklore artists in the State were honoured through a range of awards and recognitions, including fellowships, Gurupooja, Academy Awards, Yuvaprathibha Award, Grandharachana Award, Documentary Award, and M.A. Folklore Award. The Academy organised Ponniyathankam, an annual seven-day cultural festival celebrating Kalaripayattu and other traditional folk arts. An innovative programme, called Grama Sandhya, was organised during the event Gramotsavam, which involved local artists from various villages in Kerala. In memory of PK Kalan, former chairman of the Kerala Folklore Academy and a renowned folklorist, awards are given to outstanding talents in the field of folkloric knowledge. In collaboration with the South Zone Culture Centre, Thanjavur, the academy organised the National Folk Fest at various locations in Kannur, bringing together artists from West Bengal, Assam, Haryana, Jammu and Kashmir and artists from Kerala.

Margi, an organisation dedicated to the revival of Kathakali, Koodiyattom and Nangyarkoothu, strengthened its training programmes in these art forms. During this period from 2017-18 to 2024-25, Margi enhanced its reach and activities. The Kathakali group, managed by Margi, performed in different parts of the country and presented new creations that would attract the public to these art forms. The Kaliyogam has maintained a variety of creations in its repertoire so as to sustain interest in the art. Margi has its activities taking place at two locations in Thiruvananthapuram, the capital city of Kerala. The centres of the institutions at Valiyasala, where Kudiyattam and Nangiarkoothu are performed, and East Fort, which is devoted exclusively to Kathakali, have increased the number of performance sessions. Apart from regular courses, Margi offered short-term courses, particularly for international students. Margi also provided training in musical instruments such as chenda, maddalam, idakka and thimila.

Guru Gopinath Natana Gramam has gained prominence as a centre for learning, training and research in various Indian dance forms. Natyolsavam, a nation-wide dance festival celebrating the rich diversity of Indian classical and contemporary dance traditions, organised by the institution, has grown in terms of its reach and reputation during this period. The institution's infrastructure facilities have undergone significant improvements. Enrolment of students in dance has also increased.

Bharat Bhavan, which envisages a symbiosis of communities and cultures, has organised several innovative programmes. Major programmes included the Children's Drama Festival, Bharat Bhavan Arts Festival, a cultural festival, and dance festivals such as the Konkani Arts Festival, Siberian Patterns showcasing the dance of Siberia, and Marunadan Nrithasangamom, a programme featuring various dance forms from other States, including Kuchipudi and the lesser-known Sattriya. It also conducted musical programmes such as a ghazal night, a veena recital and a Hindustani music concert; an Indian poets' meet; a lecture series on art, culture and literature; literary debates; Tribhasha Sangamam; Bhasha Shibiram; national integration workshops; a Kerala Festival in Haryana; a Haryana Festival in Kerala; and screenplay and film appreciation camps. A Handbook on Cultural Institutions in Kerala and Kanaka Keralam: Charithravum Varthamanavum Souvenir featuring articles by leading figures in the fields of culture, society and education about Kerala's history, current status and future, were published.

Vasthu Vidya Gurukulam, an institution dedicated to promoting and preserving traditional architecture and mural painting, has made significant strides in diversifying its activities and offering livelihood opportunities to artists and craftsmen. The Institution nurtures Kerala's vastu sculpture tradition, mural art heritage, Daru Shila sculpture, and handicraft traditions, while promoting artistic and environmentally-friendly construction techniques. The Institution also conducted surveys and documentation of ancient structures for these purposes, and provided consultancy services in architecture, green building technology, and mural composition. It established a research unit on sustainable construction and digital documentation of heritage buildings.

The establishment of Rural Art Hubs has improved the livelihood of numerous rural craftsmen by providing opportunities to showcase and market their products. To date, 54 self-help groups of rural artisans have been registered under the Rural Art Hubs. The project to document 2D graphical representations of 15 protected monuments under the Department of Archaeology was successfully completed during the 2023-24 period. Tribal school students were trained in mural painting. Conservation work on the unique ancient wall paintings of the Ettumanur temple has been undertaken. Conservation work has been completed on the Ezhunnallat mural of Sreechithira Thirunal

Maharaja, painted by the renowned painter late Mammiyoor Ashan and his disciples, at the Sreechitra Enclave, located within the museum compound in Thiruvananthapuram.

The Centre for Heritage Studies, located at the Hill Palace in Thripunithura, Ernakulam District, aims to study the cultural heritage of Kerala and conducts workshops, seminars, and fairs. The Centre also offers postgraduate and diploma courses in the fields of archaeology, museum–related studios, and the conservation of archives. In addition to the academic activities, the Centre is responsible for maintaining the 52-acre Hill Palace Museum campus and the Deer Park. As part of the development programme, a plant nursery featuring indigenous herbal plants has been established on the Hill Palace campus.

The Sree Narayana International Study Centre, an institution dedicated to teaching and propagating the vision of Sree Narayana Guru and located in Chempazhanthy, conducted several programmes to disseminate the vision and teachings of Sree Narayana Guru. During this period, the Centre presented Sreenarayana International Awards, published the Sreenarayana Guru vision and women's equality, conducted short courses on Gurudarshan, seminars and workshops and published a glossary of Sree Narayana Guru's works, and instituted a Diploma in Athmopadesathakam. The Centre organised Sarvamatha Sammelanams, weekly study classes, monthly classes / discussions, and observed the birth/death anniversaries of Sree Narayana Guru.

Jawahar Balabhavans in Thiruvananthapuram, Kollam, Alappuzha, Kottayam and Thrissur diversified their activities and improved their infrastructure.

Archaeological Excavations and Conservation

During the last decade, the State Archaeology Department has undertaken research activities that will decisively contribute to the formation of Kerala's history. The Archaeological Department conducted noteworthy surveys and excavations at Veeyur Chenkal Guha, Ichannur Chenkal Guha and Nalloor Government L.P. School, near Feroke in Kozhikkode, Perumpadappu Valiya Kinar in Malappuram and Aranmula. Conservation activities undertaken in the printing house (*kammattapura*), the big dining hall (*valiya oottupura*), Palpura Malika and *manimeda* within the Padmanabhapuram Palace complex, Restoration of the *ettukettu*, the oldest structure of the complex, and the adjacent *kulappuramalika*, the dining hall (*vilambupura*) and the smaller *oottupura* in the Thripunithura Hill Palace, Kilimanur Palace, the Karthiayani Temple at Kuttamperoor near Chengannur, the Mahadeva Temple at Thrikodithanam in Kottayam, the Siva Temple at Thodeekkalam in Kannur, and the Aruvikkara Temples of Thiruvananthapuram has also been completed.

The Department undertook the renovation of the State Assembly's heritage building, which houses the Golden Jubilee Museum. The work on the watchtower and the walls was done using traditional lime mortar. The Department has also undertaken repairs and preservation work at several monuments, including the Jewish Synagogue at Chendamangalam. Ernakulam District, the Arakkal Palace at Kannur, the Hill Palace at Thripunithura, the Nedumangad Koyikkal Palace in Thiruvananthapuram, the Shakthan Thampuran Palace and Fort Gates in Thrissur, the Kunjali Marakkar memorial at Kottakkal in Kozhikode, the Thrikkodithanam Temple, the Krishnapuram Palace, the Pazhur Perumthrikkovil, the Venkitathevar temple at Kottakkal in Malappuram, the Ariyittuvazhcha Palace at Mattanchery, the Suspension Bridge (*thookkupalam*) at Punaloor, and the Thirunayathodu temple, among others.

Advancements in numismatic studies. Numismatic studies conducted by the Department continued to provide new insights into the socio-economic history of Kerala and ancient communities. Kerala's relationship with the rest of the world, even over two millennia ago, has been established through the collection of ancient coins. In addition to maintaining the existing coin collection obtained from various parts of the State, new research on places such as Muziris are being conducted. In 2017, the Department received a treasure consisting of 266 silver coins recovered while digging farmland in the Mundur, Cheruthazham area of Pariyaram in Kannur. These British colonial-era coins have been in circulation since 1862, with images of Queen Victoria, King Edward VII, and King George V embossed on the coins. This is the first time that the Department has received such a large number of British India silver coins.

Advancements in Archives. The Kerala State Archives Department, formed in 1962, is the custodian of all non-current records of permanent value belonging to the State Government and its various departments, institutions, and individuals. The Department also serves as the custodian of records of historical value, including Government records and palm leaf manuscripts. The Department has meticulously

conserved and protected these documents scientifically to ensure their preservation for future reference.

The Archives Department has already digitised 51,42,501 pages through C-Dit. The Archives Department envisions providing these digitised data to research scholars online through the e-Likhitham 2.0 web application software. The publication of the archival record Mathilakom Rekhakalude Sabdakosham is a significant addition to Kerala's archival literature and historical scholarship. Record management training programmes were conducted for the staff of the Archives Department to enhance their professional skills and ensure effective preservation and handling of records.

It has been proposed to establish the International Archives and Heritage Centre at the Karyavattom Campus of the University of Kerala in Thiruvananthapuram, with the Kerala Museum designated as the implementing agency. The Department has established a District Heritage Centre and Archival Gallery in Idukki, aimed at conserving and exhibiting the District's unique heritage and archival treasures. The Department has also partnered with LSGs to initiate projects to establish museums of local significance.

The Palm-leaf Manuscripts Museum in Thiruvananthapuram under the Archives Department is a treasure trove of ancient texts on palm leaves that shed light on administrative, socio-cultural and economic facets of the Travancore kingdom in Kerala which lasted 650 years till the end of the 19th century. Billed as the world's first palm-leaf manuscript museum, it is set up on the ground floor of the three-century-old complex at Fort Area, which functions as the Central Archives under the State Government. With a collection of one crore palm leaves, the State Government's nodal agency for museums, Kerala, Museum of History and Heritage, has put on display a total of 187 manuscripts, divided across eight galleries. With display boards, feature videos, QR-code systems, and installations, the museum is a favourite among researchers and those seeking to learn about the rich history of the state.

Major achievements of the Directorate of Museums and Zoos

The Department of Museums and Zoos has enhanced the facilities of museums and galleries, as well as the Zoological Park in Thiruvananthapuram, Thrissur Zoo, Natural History Museum, Sri Chitra Art Gallery, KCS Paniker Gallery, Sri Chitra Enclave in Thiruvananthapuram, Krishna Menon Museum at Kozhikode 3D theatre, and a multi-purpose museum at Thrissur. These institutions have attracted a large number of tourists. The Directorate of Museums and Zoos has created several important assets in recent years. In 2021-22, the Natural History Museum was modernised with new exhibits and visitor facilities. A new Raja Ravi Varma Art Gallery was opened in 2023-24 to showcase the works of the famous artist. In 2024-25, the AKG Smrithi Museum was established in memory of A K Gopalan, and a Handloom Museum was set up in Kannur to preserve Kerala's handloom heritage. A conservation laboratory was also established at the museum.

Way Forward

Building on the policy initiatives and institutional investments of the past decade, the way forward for Kerala's arts and culture sector lies in consolidating gains while responding to emerging social, technological, and economic realities. The State's increased budgetary allocations for culture, heritage, museums, archaeology, and allied sectors provides an opportunity to deepen reforms and scale up impact.

Kerala must move towards a more integrated cultural governance framework. Cultural policy should align heritage conservation, artist welfare, education, tourism, and digital innovation within a coherent long-term strategy. Strengthening coordination among cultural institutions, LSGs, academic bodies, and civil society organisations will ensure efficient implementation and wider public reach. Inclusivity must be further institutionalised, with greater participation of women, Scheduled Castes, Scheduled Tribes, minorities, migrant workers, and persons with disabilities. Dedicated platforms, targeted funding, and decentralised festivals at District and local levels can support equitable access and representation. Cultural spaces should also be made physically and digitally accessible.

Artist welfare must remain a central priority. Expanding social security, insurance, and pension coverage, addressing income insecurity, and ensuring continuous professional engagement — especially for senior artists — are essential. Systematic identification and registration of artists across disciplines and regions will help ensure that welfare schemes reach all eligible beneficiaries.

Heritage conservation must adopt a comprehensive and future-oriented approach. Enacting a strong Heritage Act, strengthening institutions responsible

for archaeology and folklore, and prioritising the documentation and digitisation of both movable and immovable heritage are critical. Creating a State-level open-access digital archive will safeguard cultural knowledge while enabling research, education, and public engagement.

Education and capacity-building should be reinforced to sustain cultural continuity. Integrating art, theatre, cinema, and heritage studies into school and higher education curricula will nurture culturally informed citizens. Expanding professional training in museum studies, conservation, digital arts, and cultural management will help build skilled human resources for the sector.

Kerala must harness digital and technological innovation to expand cultural production and access. Digital archiving, augmented and virtual reality in museums and public art, and the promotion of animation, gaming, and digital storytelling centred on local culture can open new creative and economic opportunities while preserving aesthetic traditions.

Cultural infrastructure must continue to grow in both scale and quality. Strengthening museums and galleries, establishing new thematic and District-level institutions, and repurposing spaces into cultural hubs can energise urban and regional cultural life. Linking cultural institutions, festivals, heritage sites, and public art through a well-designed cultural tourism circuit will further enhance Kerala's national and international cultural presence.

Together, these measures will help Kerala sustain its distinctive cultural identity, strengthen social cohesion, support artists and institutions, and position the arts and culture sector as a vital contributor to democratic values, inclusive development, and the creative economy.

Chapter 26
Sports and Youth Affairs

The Government of Kerala has made strides in developing all sectors of sports, and placed sports at the core of its youth development agenda. The State has initiated a series of investments in youth programmes spanning sport, skills training, mental-health services, and community volunteering. The sports sector in the Kerala has undergone a transformation in the last decade.

During the 13th and 14th Five-Year Plan periods, the Government of Kerala aimed to encourage and promote a vibrant culture of sports in the State, in order to achieve goals of good health, cultural well-being, broad-based recreational facilities, and social inclusiveness. In alignment with its long-term vision for inclusive and sustainable sports development, the Government of Kerala has undertaken a series of initiatives aimed at strengthening the State's sports ecosystem. These efforts are structured around focus areas including building and upgrading infrastructure, implementing targeted schemes to nurture talent, and promoting grassroots participation.

In 2023, Kerala formulated a comprehensive sports policy, guided by the principle of "Sports for All," becoming the first State in India to do so. This policy addresses inclusivity, and lays the foundation for developing a Sports Economy, a strategic vision that aims to contribute 2 to 3 per cent to the Gross State Domestic Product (GSDP) through the sports sector. The Government has adopted an action-oriented approach to reform the sector over the past decade, recognising the wider economic and social potential of sports. Beyond excellence in sports performance, the Government has emphasised decentralisation and international cooperation. The State's sports policy further envisions the adoption of Public-Private Partnerships (PPP) to attract private investment in sports infrastructure and services. The International Sports Summit Kerala, 2024 showcased the achievements and potential of the State, and secured investment offers of over Rs 5,000 crore.

Programmes including One Panchayat One Playground have provided every locality with space for young people to play and train, and the launch of more advanced infrastructure such as running tracks, swimming pools, and indoor stadiums has benefited athletes. To instil fitness consciousness and sports culture from an early age, the Healthy Kids programme has been launched in schools across the State. Flagship schemes such as "Goal, Sprint, and Hoops" continue to identify and nurture young talent in football, athletics, and basketball, respectively.

In parallel, Kerala is advancing efforts in the domains of sports education and human resource development. The promotion of higher education in sports technology, sports science, medicine, and management is a priority area, aimed at building a skilled workforce to support the emerging sports economy. The Government aimed to substantially increase employment opportunities in the sports sector.

To strengthen decentralised governance, local-level sports councils have been established across Panchayats, enabling more community-based planning and implementation. This approach ensures that sports are integrated with youth development, education, health, and local governance.

Over the past decade, the State has significantly broadened its vision for the sports sector.

Investments and Infrastructure

Plan outlays to the sports sector increased nearly 160 per cent from Rs 85.2 crore in 2016-17 to Rs 220.9 crore in 2026-27. Plan expenditure in the sector until January 2026 was Rs 941 crore. A total amount of Rs 3,500 crore, including funds to the Sports Department and to KIIFB, has been allocated for sports infrastructure development. Under the KIIFB scheme, a total of 58 projects have been sanctioned through the Sports Department.

For the construction, operations and routine maintenance of stadiums and associated infrastructures in the State, a Public Sector Enterprise (PSE), Sports Kerala Foundation has been formed by Government of Kerala in 2021-22. It functions as a Special Purpose Vehicle with the twin objectives of being an asset construction and management company that would focus on developing self-sustaining revenue generating sports assets and conducting of various grass root level programmes and projects for the development of sports in Kerala.

Kerala has significantly upgraded its sports infrastructure. District stadiums in Wayanad, Thrissur, and Kasaragod have been completed and nine District stadiums are in progress. Construction of the State's

first stadium for persons with disabilities has begun in Ottapalam. Major stadiums such as the Jawaharlal Nehru International Stadium, Jimmy George Indoor Stadium, and Greenfield Stadium in Karyavattom were modernised. The State built 26 sports complexes and 22 new synthetic tracks across Districts, as well as hockey turfs, and FIFA-standard football grounds. High-performance training centres and specialised academies for various sports have been developed to support athlete development. Football academies were started at the GV Raja school in Thiruvananthapuram and Kannur Sports Division, in collaboration with professional football clubs. The Women's Football Academy, a dedicated initiative to promote and develop football among women and girls, providing structured training, mentorship, and competitive exposure, was established in Ernakulam. The Kerala Shooting Academy was started at the Vattiyoorkavu Shooting Range in association with the National Rifle Association to mould world-class shooting champions.

Community sports infrastructure has been expanded with hundreds of mini stadiums established and school playgrounds upgraded under Government schemes. In the first phase of the One Panchayat One Playground programme, steps have been initiated to develop playgrounds in 124 Panchayats. Modern fitness centres have been established in 20 locations and open gyms in 23 centres. Key facilities such as the Thiruvananthapuram Aquatic Complex and velodrome were renovated. Technology integration, including digital coaching tools and automated maintenance systems, has further modernised training and facility management.

In addition, the construction of Kayika Bhavan, headquarters of the Sports Department, is in progress in Thiruvananthapuram.

Key Programmes and Initiatives in the Sports Sector

The Government of Kerala has introduced multiple sport-specific programmes aimed at early talent identification and the development of high-performance athletes. The Hoops programme provides basketball training to students from Classes 4 to 8 with the objective of developing world-class players. It has currently been launched in 10 schools, and will be expanded to all schools across the State. Sprint focuses on the early identification and training of athletic talent from suburban, rural, tribal, and other underrepresented areas and is being implemented at six centres. The Ace programme is designed to identify and nurture talented young tennis players, while Judoka trains children aged 8 to 11 years to become international-level judo athletes and is operational in 10 centres across the State. The Punch project is a grassroots boxing initiative for girls aged 8 to 15, and is implemented through five District centres. The Goal programme has been launched across all 140 constituencies of the State with the objective of training 5,00,000 children, with outstanding performers receiving advanced coaching. The One School One Game project was launched in collaboration with sports business major Decathlon, to distribute specialised sports equipment to select schools. The One Million Goal Campaign was launched to commemorate the FIFA World Cup 2022, provide basic football training to one lakh students across the State, identify 100 talented youngsters for intensive coaching, and also served as a platform to promote awareness of the State Government's anti-drug initiative.

Several initiatives have been designed to expand access to sports among women, coastal communities, and other traditionally underserved groups. Dheeram, a karate training programme for women, is jointly organised with Kudumbashree. Vidhyatheeram, implemented in collaboration with the Fisheries Department, provides students from coastal and inland fishing communities in 14 schools with basic training in a range of sports such as football, volleyball, basketball, badminton, table tennis, and chess. The Aaravam Coastal Games, a two-day event held in 2024 for fishermen in Thiruvananthapuram's coastal region, featured teams representing various Local Self-Governments competing in kabaddi, football, tug of war, and volleyball.

Sports have also been leveraged as a tool for public health promotion and social awareness. The Healthy Kids initiative promotes physical activity and healthy lifestyles among school children to prevent illnesses such as obesity, diabetes, and hypertension. The programme includes sports curriculum approved by SCERT for implementation in primary schools, and has been implemented in 55 lower primary schools, benefiting over 10,000 students. Ethical sporting practices were reinforced through the Anti-Doping Awareness Programme, organised in collaboration with the National Anti-Doping Agency (NADA), which engaged and educated athletes and sportspersons. Additionally, under the leadership of the Sports Minister, the Kick Drugs, Say Yes to Sports campaign was conducted as a month-long anti-drug initiative across all Districts.

Box 26.1

Kerala Sports Policy, 2023

The Kerala Sports Policy 2023 focuses on identifying and nurturing sporting talent and achieving excellence at the national and international levels. Anchored in the concept of "Sports for All, Health for All," the policy seeks to ensure that every individual in society participates in at least one sport. Continuous efforts are undertaken to promote awareness of fitness and physical activity among all sections of society.

A major emphasis of the policy is on sports development and talent identification, encompassing initiatives to provide high-quality outdoor and indoor playgrounds and training facilities for all. The policy also ensures the effective operation and maintenance of playgrounds and other sports infrastructure. The Government recognises access to sports facilities as a fundamental right.

The Kerala Sports Policy 2023 further ensures equal opportunities for all marginalised groups, including women, transgender persons, and persons with disabilities. To this end, various programmes have been developed to provide inclusive access to training and participation. In addition, the Government aims to develop sports as a significant contributor to the State's economy, and aims to increase its current share.

The Government has undertaken systemic reforms to strengthen sports governance, transparency, and economic development. An e-certificate system has been introduced to prevent the issuance of fake sports certificates. Sports councils have also been reorganised in a fully democratic manner; for the first time in India, sports councils have been constituted at the Corporation, Municipality, and Panchayat levels, with these local councils entrusted with greater responsibility for sports activities. To support the sports economy, football and cricket leagues are being organised with Government support, and Kerala became the first State in the country to launch a college-level sports league. As part of international sports cooperation with Cuba, the Che International Chess Festival, an international chess tournament named after Che Guevara, was organised.

Recognising the rapid growth and potential of e-sports, the Government of Kerala proposes to establish e-Sports Facility Centres through a dedicated agency. These centres will provide comprehensive training across PC, mobile, console, and VR platforms. The policy outlines an inclusive, well-regulated, and sustainable framework to nurture talent, strengthen the State's gaming culture, and position Kerala as a leading national destination for e-sports, while contributing to the social, economic, and personal development of youth.

Research and Development in Sports

Kerala has made remarkable progress in sports research and development, propelled by progressive Government policies, strong academic collaboration, and institutional innovation.

Sports science and performance research. The Kerala Sports Science Centre, established under the Kerala State Sports Council (KSSC), undertakes biomechanical, physiological, and psychological assessments to enhance athlete performance. In addition, academic institutions such as the Lakshmibai National College of Physical Education (LNCPE), Thiruvananthapuram, and Sree Sankaracharya University have facilitated research in areas including exercise physiology, sports psychology, and talent identification. Several State sports academies have begun integrating data-driven approaches, including the use of wearable technologies and advanced performance analytics, to provide real-time feedback to athletes and strengthen injury prevention strategies.

Indigenous sports and traditional knowledge. Research initiatives have been undertaken to document and revitalise Kerala's traditional sports, including Vadakkan Kalari, Kayyankali, and Maramadi (bull surfing), thereby integrating cultural preservation with tourism development and fitness promotion. In parallel, Kalari-based training systems are being examined for their benefits in enhancing agility, reflexes, and flexibility, with elements of these systems being incorporated into modern athlete training modules.

Sports infrastructure research and development. Innovative approaches have been adopted in sports facility design, including the development of multi-sport synthetic turfs, modular training centres, and climate-responsive indoor arenas, particularly in Districts such as Kannur and Thiruvananthapuram. In parallel, green stadium initiatives have advanced through research into eco-friendly construction practices that utilise local

materials and sustainable design features, exemplified by the use of solar panels at the Jawaharlal Nehru Stadium in Kochi.

Sports policy and economic research. The Kerala Sports Economy Development Project, the first initiative of its kind in India, aims to integrate sports into the Gross State Domestic Product (GSDP) and includes dedicated research on the sector's economic contribution. The Kerala Sports Policy (2023) was framed through academic research and extensive stakeholder consultations, with focus on inclusivity, professionalism, and the integration of sports into the education system.

Gender and inclusion research. Research institutions have undertaken studies on barriers faced by female athletes in Kerala, leading to policy changes in training access, menstruation-sensitive coaching, and hostel facilities.

Sports and the Economy

Kerala's growing sports economy contributes to the State's development in multiple ways: employment, tourism, infrastructure, and youth management. The sports economy in Kerala encompasses a wide range of financial and economic activities generated through sports-related sectors. It includes Government spending on infrastructure, employment opportunities in coaching, sports tourism, and the hosting of major events such as the Indian Super League and traditional boat races.

With the Kerala Sports Economy Development Project, a dedicated framework was launched to increase the GSDP share of sports, on the pillars of participation, convergence, collaborations, segmentation, exposure, quantification, and industry approach. This makes Kerala the first State in India to formally establish a dedicated framework to develop the sports economy. The new sports policy also includes the sports economy as a core component.

International Sports Summit Kerala, 2024 (ISSK, 2024). The Sports Kerala Foundation organised ISSK 2024 in January 2024, in Thiruvananthapuram, to pitch the State's Sports Economy and Sports Policy. Over four days, the event featured a dynamic programme of seminars, exhibitions, investor meets, and startup forums, drawing more than 5,000 delegates from diverse sectors. Its primary focus was on building a vibrant sports ecosystem and nurturing a world-class talent pool across multiple sports and games in the State, while also promoting the integration of sports into the daily lives of Kerala's people.

A landmark achievement of ISSK 2024 was the securing of investment commitments worth Rs 5,050 crore, covering a wide array of projects including infrastructure development, sports academies, and technology-driven ventures. The Summit's success and range of impact, from grassroots initiatives to global partnerships, highlights the advantages of fostering a holistic, inclusive, and future-ready sports ecosystem for the State.

Sports tourism. Sports tourism occupies a prominent position within Kerala's tourism industry and has significant potential to attract visitors from across India and the world. The State's abundant natural resources — including backwaters, beaches, hill stations, and a pleasant climate — provide ideal settings for promoting a wide range of sports tourism activities. In recent years, sports tourism in Kerala has shown a steady upward trend. Various sports federations are actively planning and hosting major events such as the Indian Premier League (IPL), Indian Super League (ISL), Pro Kabaddi League, and others, which contribute to the sector's growth and global appeal. By leveraging its unique landscape, rich cultural heritage, and expanding sports infrastructure, Kerala has emerged as a vibrant destination for sports tourism, attracting enthusiasts from across the globe.

Kerala's Performance in Sports

Kerala has achieved success across multiple disciplines, particularly in athletics, football, volleyball, and rowing. The State has emerged as an important participant in Indian football, with clubs like Kerala Blasters, while significant investments in cricket infrastructure, sports education, and scholarships have strengthened talent development. The Kerala Government has played a key role in promoting sports and youth welfare through financial support, infrastructure development, and initiatives to identify and nurture young talent.

Kerala's athletes have delivered impressive performances at national and international events. Initiatives such as Operation Olympia aim to prepare athletes for international competitions by providing world-class training, access to state-of-the-art facilities, foreign coaches, and international exposure. Under this programme, students secured 20 gold, 13 silver, and 14 bronze medals in 2018–19 across multiple sports disciplines. At the Tokyo Olympics 2021, nine

athletes from Kerala participated, including six in track and field, with Shri P R Sreejesh of the Indian hockey team winning a bronze medal—the second Olympic medal for a Keralite. In 2022, Kerala won the National Football Championship for Senior Men, defeating West Bengal and reclaiming the title after four years. In 2022–23, 2,584 participants from the State competed in various national and international competitions, winning a total of 1,705 medals. The Kerala State team excelled at the 37th National Games in Goa, winning 36 gold, 24 silver, and 27 bronze medals, and continued its strong performance at the 2023 Khelo India Youth Games in Chennai, securing 11 gold, 9 silver, and 15 bronze medals. Sportspersons trained at Kerala State Sports Council academies collectively won 70 gold, 84 silver, and 143 bronze medals across sub-junior, junior, and senior national championships. At the 2023–24 Asian Games, athletes from the State achieved notable success in events such as the 4×400 metre relay, 4×400 metre mixed relay, long jump, and 800 metres race.

The 26th Senior Women's National Football Championship was successfully hosted by Kerala from November 28 to December 9, 2021, with 32 teams competing across Kannur, Malappuram, and Kozhikode. The State launched India's first-ever college sports league through the College Sports League Kerala, organised by the Directorate of Sports and Youth Affairs and Sports Kerala Foundation. This initiative aims to cultivate a competitive sports culture in colleges, with the long-term vision of building a strong national team for the 2036 Olympics.

Youth Development Initiatives

The youth of a nation embody its aspirations and potential for transformation. As agents of change, they are uniquely positioned to promote social awareness, challenge regressive norms, and contribute to national unity and prosperity. Recognising and harnessing the energy, creativity, and resilience of young people is essential for driving inclusive socio-economic progress.

In alignment with this vision, the Government of Kerala has implemented a range of initiatives aimed at bringing youth and their potential to the forefront of the State's development agenda. The State has recognised that by channelising the enthusiasm and skills of its young population, it can accelerate progress towards social equity and economic growth. The Kerala State Youth Welfare Board and the Kerala State Youth Commission play a pivotal role in formulating and implementing youth-centric policies and programmes.

Major initiatives by Kerala State Youth Welfare Board

The Kerala State Youth Welfare Board has undertaken a wide range of initiatives to engage, empower, and recognise the State's youth. Youth clubs and centres have collectively cultivated 175 acres of land and participated in public service activities such as cleaning schools and hospitals. Skill development and livelihood programmes have provided training in areas such as cloth bag production and LED bulb manufacturing, with 680 youth in Idukki trained in LED production, the proceeds of which were donated to the Chief Minister's Disaster Relief Fund. Career guidance initiatives reached students across 200 centres, offering counselling to Class 10 and 12 students. The Kerala Volunteer Youth Action Force (KVYAF) was established to train youth in disaster preparedness, registering nearly 1.2 lakh volunteers who actively contributed to community kitchens, medicine distribution, and Covid-19 relief efforts. Cultural and sports engagement is fostered through events like Keralotsavam, a flagship festival for youth aged 15–35 organised at Block, District, and State levels, attracting participation from approximately 5 lakh youth and 6,000 clubs annually. The Youth Kerala Express project showcases exemplary youth club initiatives through competitions and public outreach, while the National Folk Fest of Kerala promotes cultural exchange and traditional folk arts from across India. Outstanding contributions are recognised through annual awards such as the Swami Vivekananda Yuva Prathibha Puraskaram and the Best Youth Club Award. In addition, media and awareness programmes, including journalism camps, social media workshops, and thematic events on occasions such as Environment Day and Independence Day, further engage youth, while the publication Yuvatha disseminates information on youth activities and initiatives throughout the State.

Key Programmes of the Kerala State Youth Commission

The Kerala State Youth Commission has implemented a range of initiatives to empower and engage youth across the State. The Youth Defence Force actively contributed to the Covid-19 response by distributing medicines, essential items, and reading materials, and by supporting quarantine centres. Awareness and training programmes reached more than 74,000 youth through over 300 sessions conducted in colleges and SC/ST nagars. Legal support was provided through the Youth Legal Support Centre, offering toll-free assistance and resolving 584 out of 800 complaints through adalats

and sittings. Outstanding achievements were recognised through the Youth Icon Awards, covering fields such as arts, culture, sports, agriculture, entrepreneurship, and social work. Health and empowerment programmes targeted marginalised groups, including tribal youth and women, in collaboration with the Department of Social Justice. Cultural and educational activities, such as the EMS Memorial Inter-University Elocution Competition, National Youth Day celebrations, and classical dance festivals, promoted holistic development. Digital initiatives, including the Virtual Employment Exchange and the Green Youth Programme, supported employment facilitation and environmental awareness. Collectively, these initiatives demonstrate Kerala's sustained commitment to structured youth engagement, capacity building, and inclusive development.

Way Forward

Over the past decade, Kerala has undertaken a new journey in the domains of sports and youth development.

The momentum built over the past decade must be leveraged to address emerging needs and challenges, particularly in expanding access and equity across all regions and communities. Strengthening grassroots infrastructure remains a key priority, with a focus on bridging regional disparities and ensuring every child has access to quality sports facilities, equipment, and coaching. Kerala's innovative schemes such as Goal, Sprint, and Operation Olympia have shown immense promise in talent identification and nurturing, but to sustain their impact, the State must invest in creating a data-driven system for long-term athlete development, supported by science-based training and continuous monitoring.

State institutions and sports academies need to collaborate more closely with universities and international bodies to integrate advancements in physiology, biomechanics, and mental training into coaching methods. As Kerala continues to build a sports economy, there is an urgent need to develop a professional workforce that can support the expanding sector. This includes athletes and coaches, as well as physiotherapists, nutritionists, psychologists, sports managers, and event coordinators. Educational institutions must offer specialised courses and vocational training in these areas to meet growing demand.

The Government must remain committed to inclusivity and accessibility, ensuring that programmes for women, athletes with disabilities, and transgender individuals are scaled up. The growing interest in sports tourism and adventure sports offers significant potential for the State. By integrating Kerala's cultural strengths such as Kalaripayattu, Vallamkali, and coastal games with tourism initiatives, the State can attract global visitors while preserving local heritage. Kerala's proactive entry into the e-sports domain must be solidified.

To support these ambitions, Kerala must enhance public-private partnerships and international collaborations. Inviting private investment, leveraging global expertise, and hosting international events can elevate the State's sports profile. Integrating sports into school curricula as a life skill rather than a recreational choice is equally vital. Lastly, a strong system of evaluation and innovation is necessary to keep pace with the rapidly changing landscape.

Chapter 27
Digital Surveys and Land Records

A Transformative Vision for Land Governance

The Government of Kerala has implemented critical reforms in land governance with the introduction of modern technology for digital land surveys and integrated land management.

Land management in Kerala has evolved over time. From the Settlement Surveys conducted between 1882 and 1934 to the resurvey initiatives launched in 1966, the State has consistently focused on documenting land ownership. By 2015, systemic inefficiencies including outdated survey methods, fragmented and inconsistent records, poor interdepartmental coordination, and limited public access to land data, hampered land governance. Cadastral maps were often decades old, and the mutation process was laborious and opaque. These challenges triggered a strategic shift toward digital modernisation under the 13th and 14th Five-Year Plans.

To ensure reliable data on current land use and ownership for citizens and to facilitate land use planning and related policy development, the Government initiated the Ente Bhoomi mission in 2022, under the Survey and Land Records Department, as a "second land reform". Through the Ente Bhoomi Digital Land Survey and the Integrated Land Information Management System (ILIMS), the Government of Kerala is establishing a comprehensive digital framework for land administration that emphasises transparency and data integrity.

Reliable, current, and digitised land records are essential for economic development, land ownership security, land-use planning, and ease of doing business. Integrated textual and spatial data form a key part of a State's statistical and administrative systems. Digitised document management improves accessibility, security, disaster recovery, and cost efficiency. Kerala aims to extend modernisation to land-use planning, water management, infrastructure development, and disaster management.

Technology Selection

A key feature of Kerala's digital survey is the emphasis on accuracy. During the planning phase, the State tested multiple technologies, including aerial drone surveys. These trials showed that Kerala's terrain — characterised by uneven topography, dense tree cover, and small, fragmented land parcels — limited the suitability of aerial methods for legally valid cadastral mapping. Drone-based surveys, with accuracy typically in the 10–15 cm range, were not adequate in a context where boundary determinations require centimetre-level precision. As a result, the State adopted a ground-based survey approach.

A Continuously Operating Reference Stations (CORS) Control Centre was established, supported by a network of 28 Stations, enabling positional accuracy of 0–5 cm in the digital land survey. This infrastructure, used with RTK (Real-Time Kinematic) rovers and Robotic Electronic Total Stations (R-ETS), supports accurate surveys despite vegetation cover and terrain variation, and has set a national reference point for technical standards.

Citizen Sensitisation and Community-Led Governance

A central element of the Ente Bhoomi mission is its approach to citizen awareness and stakeholder participation, which shifts the digital survey from a purely administrative exercise to a participatory process. The programme engages key decision-makers through focused workshops for MLAs and MPs, as well as virtual conferences for heads of Local Self-Governments (LSGs), to ensure informed support at the local level. Public trust is strengthened through targeted Information, Education, and Communication (IEC) activities and the formal establishment of Survey Sabhas and Survey Jagratha Samithis.

Before survey work begins in a village, Survey Sabhas inform residents about the process, their rights and responsibilities, and the use of digital land records. These forums have reached thousands of wards across the State. This effort is supported by local volunteers who assist with land record verification and grievance handling, serving as a link between the administration and residents. By involving elected representatives, volunteers, and citizens, Kerala has developed a land record modernisation model that emphasises transparency and participation.

Innovations and Unique Features of the Ente Bhoomi Mission

The Ente Bhoomi programme's approach to land administration is organised into defined functional domains to support accuracy, transparency, and citizen access. They are:

Technological tools and precision

The digital survey follows an end-to-end workflow in which all stages from initial notification to final publication are conducted through a single digital system, eliminating manual handling and administrative delays. The platform integrates multiple surveying technologies, including CORS, RTK, and R-ETS, and is designed to accommodate drone data for future geospatial requirements. Legacy maps and historical land records are digitised and made available on surveyors' tablets, enabling on-site reference and reducing preparation time and field errors.

A dedicated Government Land Re-fixing Module supports the geo-referencing of historical Government sketches, allowing accurate relocation of old survey stones and protection of public land. Live monitoring dashboards track the operational status of the CORS network and the real-time movement of RTK devices in the field, supporting consistent accuracy and operational control.

Citizen-centricity and transparency

The survey process emphasises direct engagement with landowners. Surveyors generate digital maps and records in real time and present them to landholders immediately after field measurements using rugged tablet PCs. Citizens receive automated SMS alerts at each key stage of the survey, ensuring continuous access to information.

Through the Ente Bhoomi portal, landholders can review their records, submit objections, and track grievance resolution without intermediaries. During the survey, land records are linked with Aadhaar to establish a verified and consistent ownership identity, strengthening data reliability across systems.

Community participation and awareness

Before survey operations begin in any village, Survey Sabhas are conducted with the participation of elected representatives and residents to create awareness and prepare communities for participation in verification activities.

Community engagement is supported by Survey Jagratha Samithis, a volunteer network of nearly 29,000 members who assist survey teams, guide citizens, and support the use of the digital portal. In addition, ward-level verification camps are held before the statutory 9(2) publication, allowing residents to review draft records and resolve issues at an early stage.

Administrative and quality governance

The programme operates under a multi-tiered monitoring framework with a State Project Management Unit (SPMU) and District-level units providing continuous technical supervision. Progress is reviewed weekly by the Revenue Secretariat under the chairmanship of the Revenue Minister and by an Apex Committee led by the Chief Secretary.

Quality control is embedded within the digital platform through tools that simultaneously validate spatial accuracy and textual data consistency. Administrative tasks such as surveyor work allocation and permission management are managed through an automated portal module, standardising operations across the State.

Legal integrity and inter-departmental alignment

Legal consistency across departments is ensured through the Digital Pre-Mutation Sketch (DPMS), which requires a verified spatial sketch before every land registration. This mechanism maintains a "single source of truth" across all departments, for all transactions, and prevents discrepancies between Survey, Registration, and Revenue records.

The mission is supported by a defined legal and procedural framework, including executive orders, detailed Standard Operating Procedures, and targeted legal amendments designed to support digital land administration and inter-departmental coordination.

Progress and National Recognition

The Ente Bhoomi mission has achieved significant progress, exceeding earlier manual survey efforts in terms of coverage, speed, and transparency. As of early 2026, the Survey and Land Records Department has surveyed more than 9.2 lakh hectares of land, covering approximately 67.5 lakh land parcels. Field surveys have been initiated in 537 villages, with draft records published under Section 9(2) of the Survey and Boundaries Act in 363 villages. A total of 123 villages have completed the process up to Section 13 and are available on the ILIMS platform for citizen services.

These outcomes have positioned Kerala as a reference point at the national level. The Department of Land Resources (DoLR) has acknowledged the project in multiple forums, and several States have approached Kerala for portal demonstrations, training, and guidance for adopting this end-to-end digital system. The "Kerala Model" is now recognised as a best practice for combining technology with citizen participation.

Multi-Sectoral Impact

The creation of an accurate, GIS-enabled digital cadastre through the Ente Bhoomi mission provides a common geospatial framework for administrative functions across Kerala and changes how departments use spatial data. In

Smart City initiatives and Town and Country Planning, the cadastre allows for urban simulations and zoning decisions. The Public Works Department (PWD) and the Kerala State Electricity Board (KSEB) can use it for buffer analysis related to land acquisition and utility corridor planning. The Disaster Management Authority can apply cadastral layers with real-time imagery for flood risk mapping and post-disaster damage assessment. The Forest and Environment Departments can use the system to monitor boundaries and conservation areas. In agriculture, the cadastre can support parcel-level crop monitoring and subsidy distribution, while the Irrigation and Water Resources departments can use digital elevation models derived from the cadastre for water-flow analysis. The Statistics Department can link demographic data with spatial parcels to generate detailed socio-economic analysis, supporting evidence-based policy implementation.

This shared geospatial infrastructure supports the State's long-term development and economic planning. The Ente Bhoomi portal functions as a central repository, providing a single, authoritative spatial reference for Government use and reducing duplication of spatial data across departments. Previously, departments independently generated spatial datasets for the same areas, resulting in repeated expenditure. By requiring the use of this centralised cadastre, the State can lower data creation costs and improve resource allocation. The availability of clear and undisputed land records also supports Ease of Doing Business (EoDB) by reducing uncertainty for industrial and commercial investments. In addition, the system establishes a State-level spatial data infrastructure that enables collaboration with national and international technology partners. This integrated approach ensures that public spending on spatial data supports multiple uses and strengthens transparency, efficiency, and coordinated governance across sectors.

Integrated Land Information Management System (ILIMS)

The Integrated Land Information Management System (ILIMS), accessed through the Ente Bhoomi portal, is the first system in India to integrate the services of the Revenue, Registration, and Survey Departments. The incorporation of digital survey data into ILIMS creates a single, consistent record across these departments, aligning revenue, registration, and survey information within a continuous digital process. As a result, spatial records are updated automatically at the time of registration, removing the need for repeated and costly resurvey programmes.

ILIMS provides a set of citizen services linked directly to this integration. Spatial records reflecting on-ground conditions are updated automatically across departments upon registration. Land registrations are processed using the Digital Pre-Mutation Sketch (DPMS) and Thandaper (TP) services within ILIMS. This framework allows essential documents, including digital sketches, to be issued within defined timelines and reduces the scope for fraudulent land transactions. By avoiding repeated resurveys and manual reconciliation of records, the system reduces Government expenditure and delivers land-related services to citizens in a more time-efficient manner.

Way Forward

A central objective for land administration in Kerala is the completion of a full digital land survey of the State, ensuring that all land parcels are measured and recorded with defined technical accuracy. This is a continuous process. Through the ILIMS portal, spatial and textual land records will be updated on an ongoing basis so that the single, authoritative dataset remains current and consistent with on-ground conditions. To further strengthen transparency, the Survey and Land Records Department plans to integrate AI-based tools for automated feature extraction and change detection, along with technologies such as 3D mapping and digital twins to add vertical data for urban density analysis and infrastructure planning.

Parallel to these technological initiatives, the legal framework for land administration is being updated. The proposed Kerala Settlement Act will replace older statutes and establish a modern settlement process for resolving long-standing land disputes. This alignment of legal reform and digital systems is intended to provide every citizen with a comprehensive Record of Rights (RoR) supported by digital data. The long-term objective is a transition to conclusive land titling, under which the State provides a legal guarantee of ownership. By moving from presumptive to conclusive titles, Kerala aims to reduce land-related litigation and create a stable foundation for socio-economic development.

Chapter 28
Initiatives for a New Kerala

In 2016, the Government of Kerala identified certain sectors in which development efforts were to be organised in mission mode. The Missions were committed to the establishment of high-quality school education; people-friendly health institutions; waste management, a clean environment, and litter-free Kerala; clean water bodies and enhanced water resources; and secure, comfortable, and safe housing and livelihoods. As it unfolded, the Navakeralam Karma Padhathi transformed conditions in every sector that it touched.The Action Plan for a New Kerala (Navakeralam Karma Padhathi) was rapidly put into place to address socioeconomic needs and build a New Kerala through progressive planning and development. Programmes under this initiative include the Aardram Mission (health), the Vidyakiranam Mission (education), the LIFE Mission (housing), the Haritha Kerala Mission (environment), and the Rebuild Kerala Initiative. As it unfolded, the Navakeralam Karma Padhathi transformed conditions in every sector that it touched.

Social and economic equity demands that policy address problems of regional economic imbalances and inequality. The Special Development Packages are targeted interventions for regional equity and balanced development. These are being implemented in three geographically challenging and ecologically sensitive districts–Kasaragod, Wayanad (including Mariyanad Package), and Idukki. A Special Development Package was developed for Kuttanad as well.

Vidyakiranam Mission

The Vidyakiranam Mission is a school education protection campaign launched under the Navakeralam Karma Padhathi Project in the academic year 2017–18. Its continuous expansion has brought transformative change to public education in Kerala.

The primary objective of the Mission is to transform public schools into centres of excellence, and enhance teaching, learning, and infrastructure. The Government's position is that academic excellence defines school excellence and that access to quality education is a fundamental right of every child. In pursuit of this vision, a range of initiatives are being implemented. For effective planning and execution, the Mission's ongoing activities are organised into five key sectors.

- Development of physical infrastructure.
- Technology integration as part of modernisation.
- Activities for academic excellence.
- Activities to strengthen community participation
- Other activities

Development of Physical Infrastructure

During the 13th and 14th Plan periods, there has been unprecedented improvement in the basic infrastructure of schools in Kerala. A total of Rs 2,598 crore has been invested through the Kerala Infrastructure Investment Fund Board (KIIFB) for school infrastructure upgradation. Under KIIFB's Rs 5 crore project, 141 school buildings were sanctioned, of which 139 have been completed. Under the Rs 3 crore project, 386 school buildings have been sanctioned, of which 213 have been completed. Under the Rs 1 crore projects, 446 school buildings have been sanctioned, and 246 have been completed. In total, 973 school buildings were sanctioned under KIIFB projects, and 598 have been completed. Additionally, with funds from sources including the State Plan, NABARD, LSGs, asset development schemes of people's representatives, and Samagra Shiksha, Kerala (SSK) projects, development works worth over Rs 5,000 crore have been carried out in the public education sector.

Technology Integration as Part of Modernisation

- All classrooms for Classes 8 to 12 have been made technology-friendly, and computer labs have been set up in Primary schools. As a result, students now have equitable access to modern technological tools as part of their learning. This has also helped uphold the State's general policy of inclusive education.
- Through the Hi-Tech School and Hi-Tech Lab projects implemented under the leadership of Kerala Infrastructure and Technology for Education (KITE) with KIIFB funding, Kerala has been able to achieve the distinction of becoming the first fully digital State in India in the field of public education. As part of these projects, 3,74,274 digital devices were distributed across 16,027 school sections in Classes 1 to 12, 45,000 classrooms in 4,752 Secondary and Higher Secondary schools were made hi-tech, and the Hi-Tech Lab project was implemented in 11,275 Primary schools. These devices were also utilised to carry out digital education activities during the Covid period. The Samagra portal, which

provides digital content necessary for the effective use of IT tools, has now been upgraded as Samagra Plus, Sampoorna, and Sahitham. Among these, the schemes implemented with KIIFB funding have acted as a backbone for the Government's initiatives in socio-economic, academic, and administrative development. To make Government-aided schools in the State technology-friendly, KITE has spent Rs 682.1 crore through KIIFB. Along with the Sampoorna and Sahitham portals, these facilities are also being utilised for Little KITES, the largest IT network of school students in India. KIIFB funds have played a decisive role in modernising public schools.

- The online and digital education made possible under the leadership of KITE Victers has earned recognition from UNICEF.
- Through Little KITES, the largest IT network of school students, training has been provided in areas such as electronics, internet, cyber security, Artificial Intelligence, 3D modeling, mobile app development, and robotics. Under the leadership of KITE, 4 lakh mothers were also given cyber security training to identify online traps, including fake news.
- Tinkering labs and robotic labs were established in schools. Kerala became the first State to provide training in Artificial Intelligence to both teachers and student.

Activities for Academic Excellence

- The Samagra Quality Education Programme was introduced to ensure quality education for students from Classes 1 to 10. As part of this initiative, a variety of activities are being implemented. A detailed action plan regarding this has also been issued as a Government Order.
- Manchadi is a child-friendly mathematics learning programme implemented by the Department of Education on a pilot basis with the support of the Kerala Development and Innovation Strategy Council, (K-DISC). The Vidyakiran Mission serves as the coordinating agency for this initiative. Manchadi introduces an innovative approach to the teaching of mathematics and is being implemented on a research basis in 100 schools across the State. The programme has been launched in 28 selected Model Residential Schools and 72 schools in Kannur, Kasaragod, Thiruvananthapuram, and Kozhikode Districts. It has been initiated experimentally in Class 5 of these 100 schools. In the first phase, the concept of fractions was introduced to children through this new methodology. Training programmes to strengthen numerical concepts were organised by grouping together teachers who implemented the Manchadi project in the 100 schools into three clusters. Subsequently, the second phase of the project has been in progress from the 2024-25 academic year onwards. Activities to assess the performance of students under the Manchadi programme are also being carried out.
- After a decade, a comprehensive curriculum revision has been implemented. The draft framework prepared for the revision was subject to public discussion. Through this process, opinions and suggestions were collected from school students, as well as from various sections of society. Based on these inputs, the curriculum was revised, and new textbooks were developed for Classes 1 to 10.
- From the academic year 2023–24 onwards, the Preamble of the Constitution has been included in all textbooks distributed to students.
- Along with curriculum revision, comprehensive reforms have also been introduced in the field of evaluation. Guidelines have been issued to ensure that all children achieve the desired learning levels. As part of this, in the 2024-25 annual examination for Class 8 a subject minimum of 30 per cent has been introduced. Students who are unable to achieve this benchmark are to be provided with additional academic support in the respective subjects, after which they will be promoted to the next class.
- Under the leadership of Samagra Shiksha Kerala, a variety of activity-based programmes have been implemented in subject areas such as language, science, social science, and mathematics.
- In line with the revised National Skills Qualification Framework (NSQF) courses, 714 Vocational Higher Secondary laboratories were modernised. All Vocational Higher Secondary Schools have been brought under the National Quality Framework. Job fairs were organised for students who completed Vocational Higher Secondary Education (VHSE) courses, through which 4,891 candidates secured employment in 2023-24 and 2024-25.
- The Varnakoodaram project has been implemented to upgrade more than 600 Pre-primary schools to international standards.
- A total of 1,486 Special Care Centres have been established in public schools to provide additional support for students with disabilities.

- With the aim of ensuring quality education, teacher empowerment programmes have been organised. Continuous training is being provided to teachers from Primary to Higher Secondary levels. In the Higher Secondary sector, a consecutive ten-day transformation programme was conducted. Vacation-period teacher empowerment included cluster trainings, induction programmes for newly recruited teachers, IT training, and learning enhancement activities, providing teachers with opportunities to participate in various capacity-building initiatives. Following the Higher Secondary School Teacher Transformation Programme (HSSTP) model, residential training programmes have also been initiated for teachers from Classes 1 to 10.
- To make the study of geography more interesting, school weather stations were established. At present, 200 weather stations are operational.
- As part of Samagra Shiksha Kerala's initiative, Skill Development Centres were established to help students earn while learning and to provide employment opportunities for those unable to complete their studies. Through this, youth up to the age of 23 are given the opportunity to pursue contemporary, job-oriented courses free of cost. In the 14 Skill Development Centres launched as a pilot project, employment opportunities have been ensured for nearly 40 per cent of the students. In collaboration with Cochin University of Science and Technology, learning activities focused on innovation and research have been implemented for learners in the general education sector through the programme titled Scheme Ecosystem.

Activities to Strengthen Community Participation

- Clean School Green School is a campaign aimed at instilling habits of cleanliness and hygiene among children and transforming them into lifelong values. The project is intended to be extended to all schools across the State.
- As part of strengthening anti-drug activities, the "No to Drugs" campaign was organised. Its follow-up activities are being actively carried forward under the leadership of National Service Scheme (NSS) and Student Police Cadet (SPC) programmes.

Other Activities

- Based on the recommendations of the committee chaired by Prof. MA Khader, the Council of Ministers approved Part Two of School Education for Excellence. Approval was granted for a provision to examine each recommendation separately and take decisions accordingly. Measures for systemic integration are progressing rapidly.
- The Kerala School Sports Meet, the largest youth sports festival in the world, was organised in Kochi in 2024-25 in the model of the Olympics. This event has set an example for the nation and is the first of its kind in India. A major achievement of the School Sports Meet was the inclusion of children with disabilities, thereby realising the vision of inclusive sports.
- The Kerala School Kalolsavam manual was revised after several years. With the objective of preserving and promoting art forms that are fading from society, new categories were added to the competitions. The most notable aspect was the inclusion of indigenous art forms.
- To develop a special curriculum for Sports Schools, initiatives have been launched under the leadership of the State Council of Educational Research and Training (SCERT), in collaboration with the Departments of Sports and Scheduled Caste and Scheduled Tribe Development.

Haritha Keralam Mission

The Haritha Keralam Mission (HKM) is an ambitious environmental initiative launched by the Government of Kerala in 2016, intended to advance sustainable development and environmental conservation, securing a balanced future for both nature and society and to address some of the most pressing environmental and public health challenges facing the State. The Mission has been launched in the backdrop of rapid urbanisation, growing population density, and unsustainable development that led to challenges such as waste accumulation, water scarcity, pollution, and the decline of sustainable farming.

The Haritha Keralam Mission is a flagship initiative of the Government of Kerala aimed at creating a cleaner, greener, and more sustainable State through community participation and integrated planning. It focuses on six key areas:

- Solid waste management involves promoting source-level segregation, encouraging home composting, and setting up decentralised waste treatment systems such as Material Collection Facilities and Resource Recovery Centres. The Mission also works with LSGs to reduce single-use plastics and conducts public awareness campaigns on sustainable waste practices.

- Water conservation and resource management includes the cleaning and rejuvenation of water bodies, promotion of rainwater harvesting, watershed development, and village-level water budgeting to improve groundwater recharge and ensure sustainable water use.
- Promotion of organic farming is achieved through training programmes, incentives for chemical-free cultivation, support for homestead and terrace farming, and marketing assistance for organic produce.
- Afforestation and biodiversity conservation initiatives include mass tree planting, reforestation of degraded lands, and protection of wetlands and fragile ecosystems, along with maintaining local biodiversity registers.
- Public participation and awareness are central, involving Kudumbashree, students, NGOs, and youth clubs through eco clubs, green protocols, and environmental campaigns.
- Convergence with other schemes ensures collaboration with MGNREGS, Swachh Bharat Mission (SBM), Jal Shakti Abhiyan, and alignment with the Sustainable Development Goals (SDGs).

The Mission is implemented through a convergent approach, combining the efforts of various Departments including Local Self-Government, Agriculture, Water Resources, Health, and Education. LSGs play a crucial role in planning and executing projects under the guidance of the Haritha Keralam Mission.

Initiatives under 13th and 14th Five-Year Plan

During the 13th Five Year Plan, the Haritha Keralam Mission focused on three core areas: water resource restoration, solid waste management, and sustainable agriculture. Emphasising community participation, especially through Kudumbashree and LSGs, the Mission aimed to ensure decentralised, grassroot-level implementation. It prioritised the rejuvenation of water bodies, promoted waste segregation and composting, and encouraged organic farming. Supported by awareness campaigns, capacity building, and technology integration, the Mission laid the groundwork for long-term environmental sustainability. It became a model for community-driven ecological restoration and sustainable development in Kerala.

In the 14th Five Year Plan, recognising the pressing ecological challenges faced by the State including water scarcity, pollution, and climate change, the Government envisioned the HKM as central to achieving a balanced approach to development that integrate economic growth with environmental stewardship. The Plan emphasised scaling up the Mission's successful models of water body restoration, solid waste management, and organic farming across all LSGs, aiming for widespread impact and sustainable outcomes. Community participation, particularly through women's self-help groups such as Kudumbashree, NHGs and decentralised governance are highlighted as vital components that ensure ownership and long-term success of the environmental programmes.

Moreover, the Government acknowledges the growing threat posed by climate change and aligns the Mission's activities with climate adaptation strategies, such as watershed management and biodiversity conservation. The integration of innovative technologies and digital monitoring tools is also encouraged to enhance transparency, efficiency, and public engagement. The 14th Plan further links the environmental objectives of HKM with improved public health and sustainable livelihoods, especially for rural and marginalised communities. To support these goals, the Government commited to strengthening institutional frameworks and building the capacities of LSGs, alongside establishing robust monitoring and evaluation systems.

Achievements of the Mission

The major achievements of the mission are as follows:

Soil and water conservation. The Haritha Keralam Mission has achieved significant progress in water conservation across Kerala. Under the Ini Njanozhukatte campaign, more than 97,000 km of water streams were rejuvenated through sustained and repeated cleaning efforts. The Mission also revived 29,461 ponds, constructed 24,826 new ponds, built 42,920 wells, and recharged 73,345 existing wells. To enhance water storage capacity, 916 permanent check dams and over 81,000 temporary check dams were constructed. A unique Rock Quarry Recharging Project was successfully implemented in the Kareepra Gram Panchayat in Kollam, with plans for wider replication across the State. For systematic water quality monitoring, 335 testing laboratories were established in Higher Secondary schools, where over 43,000 water samples were tested. Water budgeting was introduced in 537 Gram Panchayats, as well as in several Block and District Panchayats. In addition, coir geotextiles covering more than 36 lakh square metres were laid to protect stream side walls from erosion. Collectively, these initiatives demonstrate Kerala's strong commitment to

sustainable water management through community-driven and innovative practices.

Agro-environmental restoration. The Haritha Keralam Mission has launched several innovative initiatives to promote sustainable agriculture and the greening of Kerala. Under the Tharisurahitha Gramam project, cultivation has commenced on barren lands in 181 Gram Panchayats, with 13 Panchayats already declared free of barren land. The Haritha Samridhi Ward Project, which promotes eco-friendly practices at the ward level, is being implemented in 3,040 wards, of which 1,475 have been officially recognised as Haritha Samridhi Wards. The Devaharitham Project encourages cultivation on unused land belonging to places of worship, with farming activities underway on 119 acres across 72 locations. In addition, 66 industrial establishments have been selected for institutional farming, with cultivation currently progressing over 140 acres. To enhance biodiversity and local greening, the State has created 3,345 Pachathuruths (green islets), covering a total area of 1,160 acres. Further strengthening these efforts, a total of 47,04,563 saplings have been planted under the Let Us Plant a Sapling campaign as of July 31, 2025, underscoring Kerala's sustained commitment to environmental conservation and a greener, more sustainable future.

Waste management. The Haritha Keralam Mission has made significant progress in promoting eco-friendly practices across Kerala through its Green Certification programmes. As of 2024, a total of 1,029 LSGs, encompassing 19,356 wards, have achieved Green Status by implementing sustainable and environmentally responsible practices. In the tourism sector, 351 destinations have been declared Green Tourism Centres, encouraging eco-conscious travel. The Mission has also certified 59,942 institutions as Green Institutions in recognition of their adherence to environmental standards. At the community level, 2,97,483 Ayalkoottams (neighbourhood groups) have attained green certification. The education sector has recorded notable progress, with 14,483 schools and 1,434 colleges achieving Green Campus status. In addition, 3,271 markets and public spaces have been certified as green, reflecting the widespread adoption of eco-friendly systems across the State.

Specific Programmes of Haritha Keralam Mission

Garbage-free new Kerala. The Malinyamuktham Navakeralam Janakiya Campaign is a large-scale initiative to create a clean and sustainable Kerala. Launched on October 2, 2024, the campaign ran until March 30, 2025, focusing on practical waste management activities with public participation at all levels. Efforts were coordinated from the State to local ward levels to promote proper sanitation and achieve the goal of a completely garbage-free Kerala. This people-driven campaign marks a significant step toward environmental cleanliness and sustainability in the State.

Net zero carbon activities. The Net Zero Carbon Keralam campaign, launched by the Haritha Keralam Mission, aims to make Kerala a carbon-neutral State by 2050. It focuses on reducing greenhouse gas emissions and increasing carbon storage through local self-government efforts. The project is currently active in 150 Grama Panchayats and 2 Municipalities.

Under the Anganjyothi Scheme, 2,810 anganwadis are being equipped with electric cooking appliances, including 2 kW induction hobs and six types of induction-compatible utensils such as pressure cookers, milk boilers, saucepans, etc. The scheme covers 92 Panchayats selected by the Navakeralam Karmapadhathi under the Carbon Neutral Panchayat Programme, as well as two Assembly Constituencies, namely Chittoor and Kazhakoottam. Institutions such as the Digital University and Kannur Central Jail are also transitioning to net-zero models. Other initiatives include energy audits, electrical vehicle support, and training programmes, all aimed at building a sustainable, green future for Kerala.

Let's Secure the Western Ghats (Surakshithamaakkaam Paschima Ghattam). Revitalisation of streams and facilitation of natural water flow are essential to mitigate erosion and landslides in the Western Ghats region. As an initial step, scientific watershed mapping through the Mapathon exercise has been completed in 230 Gram Panchayats. In Panchayats where Mapathon activities have been concluded, interventions such as the reclamation of drains to improve water flow have been initiated. Subsequent phases focusing on landslide mitigation and slope stabilisation are also being implemented across various Districts of the State.

Green tourism (Harithatourism). With increasing tourist footfall, it has become imperative to implement the Green Protocol, or Green Code of Conduct, across all major tourism destinations. Tourist centres and access routes are being brought under the purview of this code to ensure environmentally responsible practices. In coordination with the Haritha Keralam Mission and the concerned LSGs, concerted efforts

are underway to transform all tourism destinations in Kerala into certified green tourism destinations.

Pachathuruth (Green Islets) project. Pachathuruths, or green islets, are small forested or vegetated patches that play a vital role in carbon sequestration by absorbing and storing carbon dioxide over the long term. These green spaces help regulate ambient temperatures, mitigate urban heat island effects, and reduce air pollution, particularly in urban areas. They also function as micro-ecosystems, providing habitats for birds, insects, and other small wildlife. Expanding the number of Pachathuruths in cities offers relief from heat generated by concrete surfaces and vehicular emissions, thereby enhancing urban livability while strengthening climate resilience and biodiversity.

Water budget. Kerala is the first State in India to implement water budgeting at the local government level. Led by the Haritha Keralam Mission, this initiative enables the assessment of water availability and usage to ensure local water security. To date, 628 LSGs, including Gram Panchayats and Municipalities, have prepared water budgets. The initiative promotes sustainable water management and supports informed planning for conservation and efficient water use across the State.

Let's Plant a Sapling (Oru Thai Nadaam – the Tree Planting Campaign). On World Environment Day, (June 5), the Haritha Keralam Mission launched a large-scale tree planting campaign aimed at planting one crore saplings across Kerala by 30 September 2025. The initiative seeks to expand the Pachathuruth (green islets) project and promote widespread afforestation, with special emphasis on rare and endangered species. To ensure the survival and proper maintenance of the saplings, local monitoring committees comprising LSG representatives, Biodiversity Management Committee members, environmentalists, and farmers have been constituted to oversee follow-up and care.

State-wide action programme to prevent water-borne diseases (jalamaanujeevan). The Haritha Keralam Mission, along with LSGs and Government departments, has launched the Water is Life campaign to ensure safe drinking water and prevent water-borne diseases across Kerala. The programme is being implemented in phases:

- *Well chlorination.* For the first time, all wells in the State were chlorinated scientifically to eliminate harmful microorganisms.
- *Awareness and testing.* Schools will conduct awareness drives, and water quality will be tested extensively through school labs.
- *Public water purification.* Ponds and wells will be cleaned, and waste inflow will be blocked to maintain water purity.

Funding Pattern

The Haritha Keralam Mission is funded through a multi-source model that ensures both sustainability and community involvement. The main financial support comes from the State Government through annual budget allocations. LSGs also contribute through their own Plan funds and local resources. The Mission utilises funds from Central Government schemes such as Swachh Bharat Mission, MGNREGA, and Jal Shakti Abhiyan for projects related to waste management, water conservation, and organic farming. Additionally, support from NGOs, CSR partners, and international agencies strengthens specific initiatives. While community participation is mostly non-monetary, it plays a vital role in the Mission's success. This integrated funding approach promotes local ownership and long-term impact.

Convergence with Other Departments

A key focus of HKM is the rejuvenation of water bodies, where the Irrigation Department plays a central role by restoring rivers, ponds, and canals, and supporting groundwater recharge through check dams and farm ponds. These efforts have enhanced irrigation and farming outcomes. In waste management, the HKM promotes decentralised segregation, composting, and recycling. It also encourages farmers to shift to organic practices, aligning with the State's environmental goals. By bringing together multiple stakeholders and emphasising grassroots participation, HKM has become a model for integrated, sustainable, and resilient development.

Way Forward

The Haritha Keralam Mission envisions a greener, cleaner, and more climate-resilient Kerala through an integrated, community-driven approach. Building on its success in rejuvenating rivers and ponds, the Mission plans to scale up water conservation by enhancing watershed management and using GIS and remote sensing for better monitoring. Restoring natural water flows and expanding groundwater recharge programmes in ecologically sensitive zones is a key priority.

To move towards a Zero Waste Kerala, the HKM will strengthen waste segregation laws, support recycling infrastructure, and promote circular economy practices. The role of the Haritha Karma Sena will be expanded,

along with community-based composting and biogas systems.

Climate resilience will be enhanced by increasing urban green cover, protecting wetlands and forests, and developing biodiversity corridors, especially in coastal and Western Ghats regions. The Mission also aims to adopt digital platforms, mobile apps, and QR code-based tracking for real-time monitoring and public accountability.

Further, the Mission will invest in capacity building for LSGs, women's groups, and youth eco-clubs. Stronger policy integration, multi-sector partnerships, and alignment with national missions and the Sustainable Development Goals (SDGs) will be pursued. A robust system of monitoring, evaluation, and research will guide continuous improvement.

The success stories of HKM —clean schools, restored ecosystems, and active public participation— offer a replicable blueprint for other States and regions. The Mission stands as a bold step toward community-led sustainability, making Kerala a beacon of environmentally responsible development.

LIFE Mission

Houses provided under the LIFE Mission represent a qualitatively new approach to housing for the poor in India. The high quality housing provided under LIFE and other schemes provide a new benchmark for housing for the working people and poor.

Shelter is an essential human necessity and ensuring shelter constitutes a fundamental responsibility of any Government. International legal frameworks on human rights affirm the entitlement of all individuals to a standard of living adequate to their dignity, which includes access to appropriate housing. The Constitution of India explicitly recognises the rights to shelter and livelihood, affirming that every individual is entitled to safe, secure, and decent housing conditions. The United Nations Committee on Economic, Social and Cultural Rights emphasises that the right to adequate housing should not be narrowly construed; instead, it should be regarded as a right to reside in an environment characterised by security, peace, and respect for human dignity. Similarly, Moreover, Goal 11 of the United Nations Sustainable Development Goals, established in 2015, advocates for the development of urban environments and human settlements that are safe, resilient, and sustainable.

Since the launch of democratic decentralised planning in 1996, Local Self-Governments (LSGs) in Kerala have actively supported housing for economically weaker sections (EWS). All three tiers of Panchayats prioritised social housing projects for EWS. District Panchayats in Thiruvananthapuram, Kollam, and Thrissur implemented targeted housing programmes from the late 1990s. To address homelessness, the State launched the EMS housing programme in November 2009. Alongside, the State housing department started the M N Lakshamveedu Punarnirmana Padhathi to replace and renovate older houses from the earlier "one lakh housing scheme".

As a result of prior initiatives, the housing standards in Kerala exceed the national average of India. The 2011 Census shows that the per capita floor area of residential houses in both rural and urban areas in Kerala is roughly double the all-India average. Approximately three-fourths of the total households in Kerala reside in houses of good quality. It is also noted that 88.4 per cent dwelling units in Kerala during 2018 had pucca structures, and only a negligible proportion (0.3 per cent of the total households residing in own dwellings) had kutcha structure.

Despite higher average housing size, quality, and investment in the State, Kerala exhibited housing inequality, particularly among Scheduled Castes and Scheduled Tribes. These social groups had the highest proportions of houses in dilapidated conditions. The 2011 Census reported that households from Scheduled Tribes were four times more likely to live in dilapidated housing than the national average.

Initiatives during the 13th and 14th Five-Year Plans

The 13th Five-Year Plan emphasised a Total Housing Mission. The goals of the Housing Mission include: increasing land availability and promoting productive land use, including the development of high-rise buildings; improving capital efficiency through the adoption of advanced technology and skills; strategically positioning social housing towers to address urban sprawl; exploring innovative resource mobilisation methods focused on facilitating housing access for marginalised and socially excluded populations; and integrating housing policies with the creation of new livelihood opportunities. The 14th Plan reiterated these efforts.

LIFE Mission

Over the past nine years, the Government of Kerala has placed particular emphasis on expanding housing access for people experiencing homelessness, while maintaining quality and standards. The Kerala Government has launched the Total Housing Mission, also known as LIFE Mission (Livelihood, Inclusion,

and Financial Empowerment) in 2016 to provide affordable and decent housing to the landless and homeless in Kerala. This initiative aims to integrate beneficiaries into mainstream society via economic and social security programmes.

Financing the Mission

For LIFE Mission implementation, Plan allocations were made to the Local Self Government Department (LSGD), as well as to the Scheduled Caste (SC) and Scheduled Tribe (ST) Development Departments.

The Kerala Urban and Rural Development Finance Corporation Ltd. (KURDFC) avails loans from the Housing and Urban Development Corporation Ltd. (HUDCO) with a Government guarantee, for LIFE implementation. Plan allocations are also made to KURDFC for the repayment of interest on these loans.

Between 2019–20 and 2025–26, the combined Plan expenditure on housing-related schemes of LSGD, SC, and ST Development Departments, and KURDFC, amounted to Rs 4,746.1 crore.

Besides State Plan allocation, all LSGs (including Block, and District Panchayats) allocate not less than 20 per cent of their Development Fund (excluding the Union Finance Commission grant amount) to housing. Apart from this 20 per cent, the principal amount of the KURFDC loans are repaid by LSGs.

Mission Structure and Execution

The LIFE Mission is executed through LSGs, beginning with beneficiary identification. LIFE Mission also consolidates the housing projects of various Government departments, as well as the Pradhan Mantri Awas Yojana (PMAY).

Identified beneficiaries that have signed the agreement are given Rs 4 lakh in four installments, based on the physical progress of house construction. Scheduled Tribe (ST) beneficiaries living in remote ST hamlets are given Rs 6 lakh, in five installments.

The project made a strong start with an initial survey to identify beneficiaries based on clear criteria. Ward-wise and LSG-wise beneficiary lists —including both landless-homeless and houseless households with land — were approved in Gram Sabha meetings and development seminars of LSGs, and were ready by November 2017.

In its first phase, the LIFE Mission focused on completing houses that were only partially built or left unfinished under previous housing schemes. Of the 54,116 incomplete houses identified in the State, 52,680 houses (97.3 per cent) have been completed. These were 42,850 rural houses and 9,830 urban houses. Of the completed houses, 19,153 were of SC beneficiaries and 17,400 were of ST beneficiaries.

The second phase of the LIFE Mission targeted individuals who owned land, but did not have a house. In LIFE Phase II, 1,02,448 beneficiaries were found eligible, and 98,576 houses were completed (96.2 per cent). Lists of beneficiaries from the Scheduled Caste (21,386 beneficiaries), Scheduled Tribe (10,692 beneficiaries), Fisheries (6,009 beneficiaries), and Minority (2,363 beneficiaries) Development Departments were added in this phase, as their respective housing programmes were merged with the LIFE Mission. All the additional targets were fully achieved (40,450 houses). Furthermore, the implementation of Pradhan Mantri Awas Yojana (PMAY) in both urban and rural areas was converged with LIFE in this phase.

The third phase of the LIFE Mission was a significant step towards rehabilitating landless and houseless individuals in Kerala. Kudumbashree was entrusted with conducting a survey in 2017 to identify landless and homeless individuals. After comprehensive verification, 1,57,775 beneficiaries were confirmed eligible, and 28,363 have completed house construction.

Applications were later collected with focus on potential beneficiaries among Scheduled Castes, Scheduled Tribes, and fisheries workers. Of these, 29,475 houseless and 2,054 landless-houseless beneficiaries have built houses.

Further applications were invited across all categories in 2020, to include those that had been overlooked during earlier identification drives, or that had subsequently become eligible. Of beneficiaries identified through the LIFE 2020 process, 83,768 homeless with land and 1,492 landless-houseless have completed house construction.

Among the 64,006 families identified as extreme poor under the Extreme Poverty Eradication programme (EPEP), 4,005 houses have been completed for the homeless, and 1,417 houses have been completed for the landless-houseless.

In total, 34,321 landless beneficiaries have been provided land, of which 33,326 have completed house construction.

As of October 31, 2025, the LIFE Mission has successfully facilitated the construction of 4,71,442 houses. This includes 926 flats in LIFE Towers across the State. There are another 1,26,660 houses under construction. Among the completed houses, 1,25,360 are of Scheduled Caste beneficiaries and 45,976 are of Scheduled Tribe beneficiaries. By February 2026, a

milestone 5 lakh houses had been built under the Life Mission.

Pradhan Mantri Awas Yojana (PMAY) and Other Convergences

PMAY-Urban and PMAY-Grameen are Centrally sponsored housing schemes, for households belonging to the Economically Weaker Sections (EWS) and the Low and Middle-Income Groups (LIG/MIG) in urban areas; and houseless families or those residing in kutcha structures in rural areas.

The PMAY (U) Beneficiary-Led Construction (BLC) component approves a unit cost of Rs 2.5 lakh, of which the Government of India grants Rs 1.5 lakh. The Government of Kerala, with the commitment to providing dignified housing, has merged this scheme with the LIFE Mission- thus raising the sanctioned unit cost to Rs 4 lakh. The State Government and urban LSG contribute the remaining Rs 2.5 lakh per unit. Under BLC, 1,27,048 units have been sanctioned, and 93,986 have been completed.

The State Government has also integrated urban housing programmes with livelihood support through convergence with the National Urban Livelihood Mission (NULM) and Ayyankali Urban Employment Guarantee Scheme (AUEGS). NULM provisions are utilised for skill upgradation and self-employment. Convergence with AUEGS results in 90 person-days of employment for PMAY (Urban) beneficiaries, and an additional Rs 29,970 per person in aid.

Under PMAY–G, the unit assistance prescribed by the Ministry of Rural Development (MoRD) is Rs 1.2 lakh, shared between the Central and State Governments in a 60:40 ratio (Rs 72,000 + Rs 48,000). Through LIFE Mission convergence, the Government of Kerala has enhanced the per-unit grant to Rs 4 lakh. The remaining Rs 2.8 lakh is split in a 25:40:35 ratio between Gram, Block, and District Panchayats.

Rural beneficiaries are also eligible for 90 person-days of unskilled labour under MGNREGS. Support for toilet construction is mobilised through convergence with Swachh Bharat (Grameen), MGNREGS, or other dedicated funding sources. Further scheme convergences facilitate piped drinking water, electricity, and LPG connections. As of October 31, 2025, 34,602 houses have been completed under PMAY Grameen.

Challenges

High cost of construction materials. LIFE beneficiaries face challenges due to expensive construction materials; the LIFE Mission negotiated with vendors to supply materials at 20–60 per cent below MRP, covering electrical fittings, wiring, paint, ceramic materials, tap fittings, water tanks, and cement, resulting in significant savings. In collaboration with ANERT, Rooftop Solar Plants are being installed in LIFE houses under the Green Energy Income Project.

Land-use legal constraints. Construction restrictions in CRZ and wetland areas affect some beneficiaries; the Mission is working toward legal amendments to resolve these issues.

Way Forward

Future action must focus on ensuring the long-term sustainability, affordability, and resilience of the houses created under the LIFE Mission. Land scarcity remains one of the most significant barriers for landless beneficiaries, emphasising the need for continued mobilisation of public and philanthropic land through campaigns such as Manasodithiri Mannu (3,042.2 cents of land have been pledged as donations for the landless-homeless), as well as identifying land parcels through scientific spatial planning. The possibilities of multi-storey social housing complexes, especially in urban centres, will have to be explored to accommodate the rising demand without contributing to sprawl.

Technological modernisation will be a crucial element of the Mission's future direction. Developing cost-efficient construction technologies, expanding bulk procurement of materials at reduced prices, and formalising skill development for construction workers can enhance capital efficiency and reduce financial burdens on beneficiaries. Monitoring systems for tracking construction progress, fund utilisation, and post-occupancy outcomes must be strengthened.

In the coming years, housing interventions must be increasingly linked with livelihood enhancement, access to essential services, and social protection. Special attention will be required for ST households in remote hamlets, coastal communities, and families residing in disaster-prone regions, where housing needs intersect with vulnerability to climate risks. As Kerala progresses toward universal housing security, the focus should be not only on quantitative completion of units but also on ensuring quality, resilience, and social integration.

Rebuild Kerala Initiative

The Rebuild Kerala Initiative (RKI) is a comprehensive development programme launched in 2019 aimed to address immediate post-flood relief and recovery requirements, along with the creation of a long-term framework for rebuilding the State in a sustainable

manner. RKI focuses on restoring essential services and infrastructure while integrating disaster risk reduction and climate adaptation into the rebuilding process.

The broad objectives of RKI include:

- Rebuild resilient infrastructure – Restore and strengthen housing, roads, bridges, schools, and health facilities to withstand future disasters.
- Promote climate-resilient development – Integrate sustainability and disaster risk reduction into all rebuilding efforts.
- Sustainable natural resource management – Conserve rivers, wetlands, forests, and watersheds to reduce disaster risks.
- Revive livelihoods and economy – Support agriculture, fisheries, tourism, and other key sectors through eco-friendly and climate-smart practices.
- Inclusive and people-centric recovery – Ensure participation of communities and address the needs of vulnerable groups in the rebuilding process.
- Strengthen disaster preparedness – Improve early warning systems, institutional capacity, and governance for long-term resilience.
- Mobilise resources and partnerships – Collaborate with international agencies, NGOs, and private sectors to bring in expertise, funds, and technology

Key Initiatives and Achievements of RKI under 13th and 14th Five Year Plans

Key initiatives of RKI include the establishment of climate-resilient housing and infrastructure, river basin management coupled with flood mitigation projects, and the promotion of eco-friendly agriculture alongside livelihood restoration. It also emphasises the importance of enhancing health, education, and social welfare, while advocating for the use of technology, data and international collaboration to support these goals. The mission of RKI is to "Build Back Better" by ensuring climate-resilient infrastructure, sustainable resource management, community participation, and eco-friendly livelihood revival.

During the 13th Five-Year Plan, RKI operationalised the Rebuild Kerala Development Programme (RKDP) and secured World Bank Development Policy Operation (DPO-1) support. The State completed the prior actions focused on disaster preparedness protocols, agro-ecological reorganisation of agriculture, core road network standards, risk-informed urban planning, water and sanitation policy actions, and the institutional groundwork for a River Basin Conservation and Management Authority (RBCMA). The World Bank's completion report rated the outcome as satisfactory. These reforms created the enabling environment for sector investments and institutional strengthening.

Financial assistance from external agencies

As part of World Bank Development Policy Operation (DPO1) a first tranche of USD 250 million was disbursed in August 2019. In order to have a result-based policy action, Program-for-Results (PforR) was undertaken in the 14th Five Year Plan. This was jointly financed by the World Bank (USD 125 million), Asian Infrastructure Investment Bank (AIIB) (USD 125 million), and Agence Française de Développement (AFD) (USD 120 million) — a total sanctioned amount of USD 370 million. In June 2023, the World Bank approved US$150 million as additional financing to RKI for the management of coastal erosion and water resources and to institutionalise climate budgeting and open data road maps. By July, 2025, Administrative Sanctions were accorded for Rs 8,773.5 crore across 115 projects of RKI, of which nearly Rs 5,478.3 crore (62 per cent) has been expended.

Targets and Activities of RKI

RKI's overall target is to mainstream resilience across planning, budgeting, and service delivery: from zero disaster mortality and reduced economic disruption, to climate-aligned infrastructure standards and inclusive safety nets. Activities are structured through RKDP and two Result Areas (RA) of the Program-for-Result (PforR).

Under RA-1 (Transversal Systems), targets include enhancing fiscal sustainability for shocks, operationalising adaptive safety nets via a Unified Registry and payments backbone, establishing a comprehensive Disaster Risk Financing and Insurance (DRFI) framework, notifying risk-informed urban master planning guidelines and priority action plans, and integrating downscaled climate risk information into local Disaster Risk Management (DRM) plans.

Under RA-2 (Key Sectors), targets include a functional One Health platform capable of timely zoonoses response, preparing and implementing an Integrated River Basin Management Plan for Pamba, expanding Farmer Producer Organisation (FPO) access to organised markets, and rehabilitating/maintaining the Core Road Network to resilient standards within the Pamba Basin. The Additional Financing adds targets for a Shoreline Management Plan and publishing a Climate/Environment Budget alongside the State Budget.

The Implementation Mechanism of RKI is a multi-tier system involving policy-level guidance, institutional coordination, participatory planning, transparent

funding, and rigorous monitoring to ensure Kerala's rebuilding is resilient, inclusive, and sustainable.

The Rebuild Kerala Initiative (RKI) Cell operates under the Department of Finance of the Government of Kerala, overseeing rebuilding efforts. It is supported by the Rebuild Kerala Advisory Board (RKAB), which offers strategic guidance from experts in various fields. Additionally, the Rebuild Kerala Development Partners Forum (RKDPF) facilitates collaboration with development partners and international organisations, including the World Bank and Asian Development Bank (ADB).

The Rebuild Kerala Development Programme (RKDP) is designed to integrate post-flood reconstru ction with sustainable development, emphasising climate resilience and disaster risk reduction. It ensures sectoral coordination through alignment with the State Planning Board and departmental action plans.

Departments and agencies create Detailed Project Reports (DPRs) with the assistance of RKI, which evaluates and prioritises the projects considering sustainability, resilience, and social impact. Projects receive final clearance from the High-Level Empowered Committee, headed by the Chief Minister.

Since its inception, the RKI has been funded by the State Annual Plan Budget and has obtained loans and grants from organisations like the World Bank, Asian Development Bank, Asian Infrastructure Investment Bank (AIIB) and Agence Française de Développement (AFD). It also received support from Public-Private Partnerships for infrastructure and livelihood projects. Community contributions were facilitated through local participation from Kudumbashree, NGOs, and LSGs.

Implementation at the grassroots level involves direct project execution by Departments and LSGs, fostering community participation to ensure ownership in rebuilding efforts across housing, livelihoods, agriculture, and waste management. Additionally, technology integration, including GIS mapping and digital monitoring tools, is utilised to effectively track progress through real-time dashboards.

The RKI monitors its functions through the Rebuild Kerala Initiative Monitoring Unit (RKIMU), which tracks progress, financial disbursements, and project outcomes. To ensure transparency and accountability, independent audits and reviews are conducted, along with grievance redressal and feedback systems available on digital platforms.

Capacity building involves training for officials, engineers, and community leaders in resilient infrastructure and disaster preparedness. It focuses on documenting lessons learned from floods and sharing best practices to facilitate replication, as well as collaborating with national and international experts for technical support.

RKI functions as an integrator across 14 Departments, aligning policies, investments, and data for resilience outcomes.

Way Forward

The main hurdles RKI faced were ensuring speed, inclusiveness, implementation timelines, land acquisition issues, climate uncertainties, and recurring floods. In order to overcome this, RKI has prepared a long-term strategy, emphasising resilience, sustainability, inclusivity, and innovation, to ensure that Kerala is rebuilt stronger and safer. This includes strengthening disaster-resilient infrastructure, expanding green energy and eco-friendly initiatives, enhancing community resilience and livelihood security, integration of technology (GIS, AI, Early Warning Systems). There is a shift of focus from reconstruction to resilience to ensure that future development reduces disaster risks, prioritises inclusive growth, especially among vulnerable and marginalised communities, and strengthens Kerala's position as a global model for climate-resilient recovery and sustainable development.

Special Development Packages In Kerala

Over the past decade, Kerala has consolidated policy measures to ensure regionally inclusive development, particularly by means of Special Development Packages for Kuttanad, Idukki, Kasaragod, and Wayanad. These packages, carefully designed and implemented, have brought progress and change to areas long challenged by ecological fragility, infrastructural deficits and social vulnerabilities. Significant progress has been achieved, including, for example, the establishment of flood-resilient infrastructure in Kuttanad, enhanced health and education facilities in Kasaragod, sustainable agricultural and tribal empowerment in Wayanad, and ecological conservation alongside connectivity improvements in Idukki. Each of these packages embodies a multi-sectoral approach that combines investments in physical infrastructure, improvements in social development, environmental conservation, livelihood enhancement, and the strengthening of institutional capacity.

Guided by institutional change, participatory planning, and substantial financial allocations, the Government of Kerala's commitment to balanced growth is reflected in the breadth and impact of these interventions.

The Kasaragod Development Package

Historical background and rationale

Kasaragod has long occupied a distinct place in Kerala's development discourse due to its persistent socio-economic challenges and the perception of administrative neglect arising from its geographical distance from the State's administrative centres. Recognising these historical imbalances, the Government of Kerala constituted the Dr. P Prabhakaran Commission, which undertook a systematic assessment of the District's development deficits. The Commission's findings provided the foundation for formulating the Kasaragod Development Package (KDP), which was envisioned as a long-term, multi-sectoral intervention designed to foster comprehensive and inclusive development.

The KDP envisaged a total investment of Rs 11,123.1 crore, reflecting an ambitious financing framework. Contributions were expected from a range of sources, including Rs 2,524.6 crore from the Government of Kerala, Rs 756.2 crore from the Government of India, Rs 543 crore from external agencies, Rs 7,264.2 crore from Central Public Sector Undertakings, and Rs 35.2 crore from other sources. The mobilisation of such a diverse set of financial stakeholders underscored the recognition of Kasaragod's developmental importance and the scale of investments required to transform its infrastructure and social sectors.

Administrative architecture and implementation mechanisms

The administrative structure designed for the implementation of the KDP reflects Kerala's institutional preference for decentralised, committee-based governance with accountability at multiple levels. A District-Level Committee (DLC) chaired by the District Collector was entrusted with the responsibility of granting administrative sanction for projects costing below Rs 5 crore with expert recommendations from Kerala State Planning Board. For projects exceeding this threshold, a State-Level Empowered Committee (SLEC), chaired by the Chief Secretary and assisted by the State Planning Board, assumed the decision-making authority. This tiered structure ensured that both District-specific knowledge and State-wide developmental priorities informed the sanctioning and execution of projects.

The role of the State Planning Board was particularly significant because it acted not merely as a monitoring body but as a technical and evaluative intermediary. Administrative sanction could only be issued once the Board had vetted the proposal. As a result, the projects implemented under the KDP exhibited strong alignment with broader State-level development strategies.

Between 2013–14 and 2024–25, a cumulative allocation of Rs 1,002 crore was provided through the State Budget, and a total of 741 projects, with an aggregate sanction of Rs 976 crore were approved. Of these, 540 projects were completed and 201 remained ongoing as of August 2025, reflecting substantial progress over a decade of implementation.

Strengthening the health sector

The health sector has consistently been one of the strongest pillars of the KDP; 64 health projects with a cumulative sanctioned amount of Rs 119.5 crore were taken up between 2016 and 2025, of which 46 projects worth Rs 52.1 crore were completed and 18 projects worth Rs 67.4 crore were nearing completion. These included the expansion of primary and secondary care facilities, the construction of new hospital buildings, the modernisation of diagnostic services, and investments in waste management systems in hospital premises.

The most emblematic project within the health sector is the Kasaragod Medical College, whose foundation was laid in 2014. Since then, seven projects amounting to Rs 71.4 crore have been sanctioned for the institution. Notably, the Medical College is expected to commence functioning within the 2025-26, which signifies a major institutional achievement and is likely to redefine the District's health-care landscape by reducing referral dependence on distant institutions.

Expanding access to education

The KDP has also placed considerable emphasis on enhancing educational infrastructure. Across the District, 152 projects amounting to Rs 137 crore were sanctioned between 2016 and 2025, with 99 projects completed and the rest progressing at various stages. These works focused on upgrading school buildings, science laboratories, libraries, sanitation blocks, and digital learning infrastructures. The improvements have contributed to inclusive learning environments and better academic conditions, particularly in rural areas.

A particularly impactful intervention in the education sector relates to Mission Anganwadi, through which anganwadi centres lacking adequate facilities

were provided with modern buildings and child-friendly infrastructure. The successful implementation of this initiative earned Kasaragod the State Government Award for excellence in the functioning of the Women and Child Development Department.

Infrastructure, irrigation, and social protection

Beyond the social sectors, the KDP has invested heavily in physical infrastructure. Road development, bridge construction, public building improvements, and drainage systems have contributed to the enhancement of connectivity across the District. In an area such as Kasaragod, where many villages are located in hilly or riverine regions, these improvements have strengthened access to markets, health facilities, and schools.

Similarly, irrigation and water conservation projects have played a vital role in addressing seasonal water scarcity. The construction of check dams, vented cross bars, rubber dams, and river rejuvenation structures has contributed to groundwater recharge and more efficient water distribution.

Social justice initiatives have included the construction of Smart Anganwadis, the promotion of welfare centres for marginalised groups, and capacity-building programmes such as the Munnottu project, which aims to improve the representation of local candidates in Government service by providing specialised coaching for PSC examinations.

Impact and significance

The Kasaragod Development Package has resulted in transformative improvements in the District's social and physical infrastructure. The steady progress over a decade, coupled with continuous monitoring by the SLEC and State Planning Board, has enabled the District to overcome many historical developmental bottlenecks. The comprehensive scope of interventions across sectors, the scale of financial commitments, and the institutional maturity of the implementation framework make the KDP a model for integrated regional development.

The Idukki Development Package

Developmental context and rationale

Idukki is among Kerala's most geographically challenging Districts, defined by its mountainous terrain, dispersed settlements, and ecological sensitivity. The region faces a unique combination of constraints: environmental fragility characteristic of the Western Ghats, infrastructural deficits in transport and connectivity, a relatively weak social service network in remote settlements, and fluctuating agricultural productivity due to water scarcity and soil erosion. In response to these complex challenges, the Government of Kerala launched the Idukki Development Package (IDP) in 2022–23. The implementation of the package has gained significant momentum, with 27 projects totalling Rs 108.9 crore approved by the State-Level Empowered Committee and State Planning Board between 2022 and October 2025.

The primary motivation behind the IDP is to achieve balanced and inclusive growth by addressing social, economic, and ecological concerns simultaneously. Its focus spans agricultural development, ecological conservation, higher and general education, health, tourism, infrastructure, irrigation, and tribal welfare. The package also seeks to strengthen local participation in development, particularly through farmer-based initiatives and region-specific interventions. Beyond these conventional sectors, the package demonstrates innovative thinking in addressing contemporary challenges unique to Idukki.

Institutional and administrative framework

The implementation of the IDP is overseen by a multi-tiered governance structure that closely mirrors the arrangements adopted in other District packages. A District-Level Committee chaired by the District Collector approves projects costing below Rs 5 crore, while larger projects are sanctioned by the State-Level Empowered Committee (SLEC) in consultation with the State Planning Board. Additionally, a District-Level Technical Committee headed by the District Collector is authorised to issue technical sanctions without any financial ceiling. This arrangement ensures that technical expertise, decentralised decision-making, and coordinated State-level oversight work together to advance project implementation.

Between 2022 and October 2025, the SLEC and State Planning Board approved 27 projects amounting to Rs 108.9 crore , out of which 13 received administrative sanction, with the remaining projects progressing toward approval.

Education sector

In the sphere of education, the IDP seeks to strengthen both general and higher education infrastructure across remote and hill regions: projects valued at Rs 31.6 crore have been sanctioned. These include the establishment of an advanced laboratory at Government College, Kattappana (with an estimated cost of Rs 5 crore), the construction of a new building for Elappara Panchayat High School (Rs 5 crore), the development of a new

building for Vanchivayal Government Tribal School (Rs 5 crore), additional staff quarters at the Government Polytechnic College in Nedumkandam (Rs 4.5 crore), and the expansion of facilities at Government HSS, West Kodikulam (Rs 4.2 crore).

The sector also includes higher education projects valued at Rs 7 crore, involving the creation of an advanced laboratory facility at Government College, Kattappana, and the development of an amenity centre and multipurpose gymnasium at the Government Engineering College. Together, these interventions reflect a substantial commitment to improving the quality and accessibility of higher education in a district where geography often restricts mobility and educational opportunities.

Health sector

The health sector under the IDP has been strengthened through investments amounting to Rs 19.8 crore, as noted in the education–health file, and Rs 14.5 crore, as detailed in the IDP document. These funds have supported infrastructure upgrades and the expansion of essential services across the District. Among the prominent initiatives is the allocation of Rs 10 crore for the development of the Udumbanchola Government Ayurveda Medical College, which signifies the State's recognition of the importance of traditional medical systems. Additional allocations include Rs 4.9 crore for the construction of a Vaccine Storage Facility in Idukki and Rs 4.9 crore for building staff quarters at the Nedumkandam Taluk Hospital.

The construction of a new block at the Nedumkandam Taluk Hospital and improvements to peripheral health facilities further contribute to enhancing the District's health infrastructure. Given Idukki's challenging terrain, these projects play a crucial role in improving access to healthcare for remote and rural populations.

Irrigation, infrastructure, tourism, and tribal development

Idukki's agricultural potential hinges on effective irrigation and watershed management. The IDP has therefore allocated about Rs 4 crore for watershed development, canal expansion, and other irrigation projects. These works contribute to soil and water conservation in areas prone to soil degradation and water shortage.

In addition, infrastructure projects valued at Rs 13.3 crore seek to improve connectivity across the District through the construction of bridges, hostels, and public service facilities. The package also gives attention to tourism development, with Rs 3.7 crore sanctioned for facilities such as the boating project at the Idukki Dam Reservoir and the preparation of a tourism master plan.

The package also includes tribal development initiatives, such as the construction of a new building for Wanchivayal High School with an allocation of Rs 5 crore. These interventions collectively underscore the package's commitment to social inclusion and the well-being of vulnerable communities.

Significance and outlook

The Idukki Development Package represents an integrated response to the structural vulnerabilities and development demands of one of Kerala's most ecologically sensitive regions. Through its focus on sustainable development, improved social services, and infrastructure enhancement, the package has begun laying the foundations for long-term resilience.

The Wayanad Development Package

Background, objectives, and institutional design

The Wayanad Development Package (WDP) is a region-specific initiative aimed at addressing the deeply rooted socio-economic vulnerabilities of Wayanad, a District characterised by a large tribal population, significant human–wildlife conflict, and infrastructural gaps arising from difficult terrain and dispersal of settlements. The package came into effect in 2022–23, with an annual allocation of Rs 75 crore, and is implemented through a District Committee chaired by the District Collector. Projects costing below Rs 5 crore are approved at the District level, while larger projects require approval from the SLEC with the oversight of the State Planning Board.

The WDP's objectives encompass a wide range of developmental areas, including infrastructure expansion, agricultural support, tribal welfare, ecological conservation, tourism promotion, and social sector development. The package also attempts to foster participatory planning and environmentally responsible development, reflecting the district's ecological sensitivity.

As of October 2025, the WDP has approved 115 projects, with administrative sanction issued for 45 of them. A total expenditure of Rs 1,359.8 lakh has been reported. Three projects have been completed, while 42 are ongoing, signifying steady progress.

Education development

The education sector has received considerable attention under the WDP: Rs 54.1 crore has been sanctioned, including new academic blocks, science laboratories,

and additional infrastructure in colleges and schools. One of the most significant investments is the construction of a new academic block for Government College, Mananthavady, with an outlay of Rs 11.5 crore, accompanied by an auditorium-cum-indoor stadium costing Rs 7.5 crore. Similar infrastructure enhancement has occurred at Koleri Higher Secondary School (Rs 3.3 crore), Kalpetta Government College (Rs 3.7 crore), and the Government Engineering College (Rs 4 crore), where a Centre for Construction Technology Development and Training is being established.

Higher education infrastructure projects worth Rs 19 crore are also underway at Government College, Mananthavady, indicating the District's emphasis on strengthening post-secondary educational accessibility in the region.

Health sector

Health-sector interventions amounting to Rs 15.8 crore have been sanctioned under the WDP, with Rs 5 crore spent as of 2024–25. These initiatives are particularly important given the District's significant tribal population, many of whom live in remote areas with historically limited access to health facilities. One of the largest investments is the purchase of a CT Simulator for the Government Tribal Cancer Care Centre (Rs 6.8 crore), which considerably enhances the District's oncology diagnostic capacity. Additional interventions include the procurement of laparoscopic equipment for District and Taluk hospitals (Rs 4 crore), installation of physiotherapy equipment at Noolpuzha Family Health Centre (Rs 2.5 crore), and the construction of a multi-purpose building at Sultan Bathery Taluk Hospital (Rs 1.7 crore).

These improvements mark an important step toward reducing dependency on facilities outside the District.

Tribal development and human–wildlife conflict mitigation

Projects targeted at Scheduled Tribe development amounting to Rs 6.7 crore are currently being implemented. These projects aim to improve housing, education, healthcare, and livelihoods in tribal regions. One notable project nearing completion is the Online Examination Centre at the Government Engineering College, Wayanad, which will allow local students and job aspirants to take online examinations within the District, thereby reducing the barriers posed by travel and accessibility constraints.

Human–wildlife conflict is among the most pressing challenges in the District. To address this, administrative sanction has been issued for a project costing Rs 5.9 crore for the installation of solar-powered fencing in vulnerable areas. A portion of the work, valued at Rs 1.7 crore, has already been completed, and the remaining work is in the final stages of implementation. This intervention is expected to substantially reduce crop loss and improve the security of communities residing along forest fringes.

Agriculture, irrigation, animal husbandry, and tourism

Agricultural and irrigation projects valued at Rs 18.8 crore are under implementation, and they aim to expand irrigation coverage, enhance water availability, and support sustainable farming practices. Similarly, animal husbandry and dairy development projects valued at Rs 10 crore are being undertaken at the Veterinary University in Pookode, which are intended to modernise livestock management and improve veterinary services.

Tourism development projects have included the development of Pazhassi Park in Mananthavady and the installation of an open gym in Sultan Bathery Town Square. These improvements not only enhance recreation facilities but also contribute to the district's tourism potential.

Overall assessment

The Wayanad Development Package presents a comprehensive strategy for addressing the District's complex developmental challenges. Its emphasis on education, health, tribal development, and ecological sustainability reflects the specific needs of Wayanad's population. While physical progress has been slower relative to the scale of sanctioned works, the package has established a strong institutional structure that is likely to support more rapid implementation in the coming years. Its integrated focus also positions Wayanad as a potential model for sustainable and inclusive development in ecologically sensitive regions.

The Mariyanad Rehabilitation Scheme

Background and rationale

The Mariyanad Rehabilitation Scheme forms an important part of Wayanad's broader developmental landscape, although it is not a district-wide package like the WDP. Instead, it is a targeted intervention designed to address a long-standing issue of landlessness among Scheduled Tribe families. The Mariyanad Estate, originally a 233-hectare coffee plantation operated by the Kerala Forest Development Corporation (KFDC), was located within the vested forest land for which the

Government had obtained clearance from the Ministry of Environment, Forest and Climate Change. With the discontinuation of plantation activities, the land became available for redistribution.

Following assessment and verification, 135 hectares of this land were allotted to 341 eligible Scheduled Tribe families under the provisions of the Forest Rights Act. This decision marked a major step in the State's efforts to address the historical injustice of land alienation experienced by tribal communities in Wayanad.

Labour dispute, compensation, and integration with the Wayanad Package

The plantation workers who had been employed by KFDC demanded compensation as a condition for vacating the land. They insisted that they would withdraw their protest only after the Government ensured that all former plantation workers received fair compensation. Responding to this issue, the Chief Minister directed the District Collector to provide a detailed recommendation regarding the compensation payable. The matter was subsequently taken up by the Scheduled Tribes Development Department during the Annual Plan discussions for 2025–26 held at the State Planning Board.

As a result, the Government earmarked Rs 5 crore under the Wayanad Development Package for 2025–26 specifically for compensating the former workers. A meeting held on 5 June 2025 under the chairpersonship of the Minister for Scheduled Castes and Scheduled Tribes and Backward Classes Welfare confirmed that this amount would be distributed proportionate to the workers' respective lengths of service. An official order issued on June 28, 2025 by the Member Secretary of the State Planning Board formally sanctioned this amount for disbursement.

Long-term significance

The Mariyanad scheme represents an intervention that goes beyond mere land redistribution. Its integration with the Wayanad Development Package ensures that the resettled families will receive the necessary social and physical infrastructure — such as housing, access to healthcare and education, and livelihood support — to build sustainable lives in their new settlements. The scheme therefore stands as a powerful example of Kerala's commitment to restorative justice and the strengthening of tribal rights. It also illustrates the government's efforts to integrate targeted rehabilitation programmes into broader District-level development strategies.

Conclusions

Across the Districts of Kasaragod, Idukki, and Wayanad, as well as in the specific case of the Mariyanad Rehabilitation Scheme, Kerala's development packages demonstrate a coherent approach to reducing regional disparities through targeted, participatory, and institutionally coordinated planning. While each District faces distinct developmental barriers, the State's planning strategy reveals a consistent emphasis on improving health and education services, enhancing public infrastructure, protecting ecological resources, and ensuring inclusive growth for marginalised communities.

Kasaragod shows the most mature implementation trajectory, having benefitted from sustained investments over more than a decade. Idukki presents a developmental model that integrates ecological conservation with infrastructure expansion. Wayanad, through its development package and the Mariyanad initiative, demonstrates a firm commitment to tribal development, conflict mitigation, and improved public services in one of Kerala's most vulnerable Districts.

Together, these interventions reflect the State's broader vision of inclusive and sustainable development, grounded in decentralised governance and long-term structural transformation.

The Kuttanad Special Package: A Review of Post-Flood Development Interventions

Kuttanad, one of the most ecologically fragile and agriculturally significant regions of Kerala, occupies a distinctive position in the developmental imagination of the State. The unique geographical characteristics of the region — including vast stretches of below-sea-level paddy fields, a dense network of rivers and canals, and heavy dependence on water-based agricultural livelihoods — make it especially vulnerable to floods, soil degradation, salinity intrusion, and hydrological instability. The devastating floods of 2018 exposed and amplified these vulnerabilities, resulting in widespread destruction of infrastructure, displacement of communities, and long-term disruption of agrarian and ecological systems.

In the aftermath of the floods, the Government of Kerala entrusted the State Planning Board with the responsibility of conceptualising and articulating a comprehensive development framework for the region in the form of "A Special Package for Post-Flood Kuttanad." This package sought to integrate water resource management, agriculture, livestock development, fisheries, industry, drinking water,

tourism, energy, and multiple other sectors into a unified and synergistic development strategy. Its overarching objectives included reinforcing the ecological stability of the Kuttanad wetland ecosystem, safeguarding and strengthening the livelihoods of farming and fishing communities and building climate-resilient infrastructure capable of mitigating future disasters.

The Government of Kerala later announced the Second Kuttanad Package on 17 September 2020, signalling a continued commitment to long-term investment in the region.

Hydrological and water resource interventions

The most substantial set of interventions under the Kuttanad Package pertains to water resource management. This is unsurprising, given that the region's hydrological instability lies at the root of its vulnerability. The Water Resources Department has undertaken an array of flood-control, riverbank protection, desilting, channel regulation, and lake-restoration projects that together represent the structural backbone of the package.

One of the largest components is the extensive flood-control programme across Kuttanad, with a financial outlay of Rs 349.9 crore. More than half of the planned work — specifically 53.3 per cent — has already been completed. Of the 362 individual works sanctioned under this umbrella, 193 works have reached completion, while the remainder is progressing. Financial progress has reached 60 per cent, indicating steady movement across multiple sites.

Complementing the flood-control works are interventions funded through the NABARD Rural Infrastructure Development Fund (RIDF) amounting to Rs 61.4 crore. These projects have achieved 64 per cent physical progress, with seven out of eleven sanctioned works completed and financial progress at 63.2 per cent. Together, these efforts contribute to strengthening the region's structural ability to absorb heavy monsoon flows.

Another critical initiative is the Room for River Project, with an allocation of Rs 4.5 crore under the Rebuild Kerala Initiative (RKI). Although still in the investigative stage with a financial progress of 29 percent and an expenditure of Rs 1.3 crore, this project represents a long-term hydrological re-engineering effort modelled on international best practices to restore river space and reduce flood risk.

A distinct category of works relates to the Thottappally region, an area central to Kuttanad's drainage and flood-release system. Multiple riverbank protection works have been sanctioned in this area. The first set involves improvements to the left and right banks of the Pampa River between the Viyapuram bridge's downstream section and the Prayathery *padasekharam,* with an administrative sanction of Rs 2.5 crore and 16 per cent physical progress. A second segment, also sanctioned at Rs 2.5 crore, covers the stretch from the same downstream point towards the next reach and has reached 19 percent physical progress.

A much larger sanction of Rs 33.3 crore covers comprehensive riverbank protection along the stretches passing through Viyapuram, Cheruthana, and Karuvatta Panchayats. These works, which include stabilisation of the Thottappally Pozhi leading channel, show 21 per cent physical progress and 23.2 percent financial progress.

Desilting of *kayals* and canals surrounding the Kuttanad Taluk constitutes another major effort. Under the Kuttanad Infrastructure Development Corporation (KIDC), Rs 160 crore has been allocated for removing silt and accumulated debris from water bodies. This large-scale initiative, supported by KIIFB funding, is currently progressing, after soil studies were conducted across 12 Panchayats.

Restoration of the Puzhukkamala *kayal* area in Vembanad Lake represents a complex and environmentally sensitive undertaking. The original project cost of Rs 107.9 crore has been re-estimated to incorporate mangrove-based eco-bunds. Different appendices of the new technical design propose silt removal, eco-friendly bund construction, expanding lake approach areas, planting mangroves, and improving access infrastructure, including motor sheds, box culverts, and ancillary structures. A revised DPR of Rs 103.9 crore was submitted to KIIFB on October 27, 2025.

The Manimala River has also been the site of active riverbank protection works, with an allocation of Rs 1 crore under the RKI. These works demonstrate an impressive 92 percent physical progress and 78 percent financial progress.

At the mouth of the Thottappally spillway, another substantial project is underway with a sanctioned amount of Rs 37 crore. The spillway protection works, financed through Plan funds, are progressing with 21 per cent physical completion and 7 per cent financial progress as of March 2025.

One of the technically most demanding interventions concerns the construction of groynes at the mouth of the Thottappally Pozhi. The original

sanction of Rs 46.4 crore proved inadequate when the revised estimate — based on IIT Madras's updated bill of quantities and new DSOR 2021 rates — reached Rs 67.8 crore. A revised administrative sanction request has been forwarded to the Government. Alongside, the Harbour Engineering Department is conducting a joint study with the Central Water and Power Research Station (CWPRS), Pune. The Government has directed that any final proposal must incorporate the study's findings.

Smaller but locally important works include the protection of the Vaishyambhagom canal stretch in Nedumudi panchayat with Rs 0.75 crore, which has already been completed as an RKI project.

Phase II of the Room for River initiative addresses multiple sites across Achenkovil and Pampa Rivers. Four major works, collectively sanctioned at Rs 36 crore, are at various stages of execution. The largest of these, costing Rs 16 crore, involves deepening the river, stabilising embankments with geotextiles and granite, and constructing bunds between Melppadam and the downstream of Viyapuram. It has achieved 70.4 per cent physical progress and 63.3 per cent financial progress. Another segment costing Rs 5 crore near Mankotta towards Ettumanoor has progressed by 64.9 per cent physically and 64.9 per cent financially. A third segment, costing Rs 9 crore, involves deepening and embankment stabilisation between Kuttukuzhy and Mundattankarathodu in the Kayamkulam and Haripad constituencies. Although its progress is modest at 3 per cent, it reflects the long-term and technically complex nature of these works. A fourth segment costing Rs 6 crore, extending from Thuruthhel bridge to Mundathinkarathodu, shows nearly 17 per cent physical and financial progress. Riverbank protection along the right bank of the Pampa between Viyapuram and Melppadam shows 35 per cent progress, while the corresponding left bank protection shows 64 per cent completion.

A series of centrally supported flood management projects under the Flood Management Programme (FMP), initiated as part of the first Kuttanad Package, have reached completion. The first of these, KEL I, involved flood mitigation across groups 1 to 14 in Nedumudi Panchayat and received Rs 11.2 crore as central share, with a total expenditure of Rs 19.9 crore. All works under this project have been completed.

KEL II, focusing on flood control in four *padasekharams* across the *kayal* region, had a sanctioned cost of Rs 118.9 crore and is also completed, with the central share amounting to Rs 65.9 crore and total expenditure of Rs 126 crore.

KEL III, addressing flood mitigation across 231 *padasekharams* in Kottayam and Alappuzha Districts, was sanctioned at Rs 106.1 crore. Out of 57 works, 48 have been completed, 4 foreclosed, and 5 terminated. A central share of Rs 49.6 crore has been received, and the expenditure stands at Rs 89.6 crore.

KEL IV, covering Onattukara and its 12 wetlands, was sanctioned at Rs 70 crore and achieved full completion by December 2019. Five wetlands and 21 works were completed, with expenditure reaching Rs 61 crore and central support of Rs 11.3 crore.

Together, these water resource interventions form the most critical component of the overall Kuttanad Package. They collectively aim to reduce flood intensity, manage sediment flows, stabilise riverbanks, protect the wetland ecosystem, and improve the long-term sustainability of wetland-based agriculture.

Agriculture and landscape restoration

The Agriculture Department has focused on strengthening the agrarian systems that define Kuttanad's socio-economic fabric. A central initiative has been the preparation and implementation of a crop calendar, formulated through consultations involving the District administration, agricultural officers, research institutions, KSEB, and farmer organisations. This calendar seeks to synchronise agricultural operations with hydrological and climatic patterns to minimise risk and maximise yields.

A long-term programme for infrastructure development in the *padasekharams* and the replacement of *petti* and *paras* (sluice structures) has been underway since 2019–20. Progress has been steady, with 103 *petti* and *paras* replaced to date, significantly improving water-regulation capacity in the paddy fields.

A dedicated project for the sustainable development of the Kuttanad rice ecosystem, sanctioned at Rs 2.9 crore under the RKI, has been completed. It included support for farmers and the strengthening of the Kerala Centre for Pest Management (KCPM). A new building for KCPM at Kalarkode in Alappuzha has been constructed as part of this initiative.

A project aimed at livelihood enhancement through integrated farming (under the RKI), sanctioned at Rs 0.85 crore, has been completed, resulting in the establishment of 248 integrated farming units. Another project addressing the rehabilitation of flood-affected areas of the Manappurampunja in Mavelikkara block

involved an expenditure of Rs 0.6 crore and has been completed successfully.

Efforts to modernise pumping systems for paddy fields across Alappuzha, Kottayam, and Pathanamthitta Districts include a large project costing Rs 40 crore, financed through an RIDF loan of Rs 38 crore and a State share of Rs 2 crore. The tender process has been completed, and the State Agricultural Engineer is acting as the nodal officer.

Direct assistance for paddy cultivation has continued with support in 2024–25 for 23,345 hectares, offering subsidies of Rs 5,500 per hectare along with assistance for liming and micronutrient application. Mechanisation support has also been significant; the Sub Mission on Agricultural Mechanisation (SMAM) has facilitated the provision of about 70 combine harvesters to local farmers over four years.

KAU has strengthened its varietal development efforts in Kuttanad by releasing two high-yielding rice varieties. KAU Aadhya (MO 24) is a medium-duration variety, while KAU Punya (MO 25) is a short-duration variety suited to timely cropping in the region. Both varieties offer strong yield potential, stress tolerance, and improved profitability for farmers. In addition, KAU is working on the line KAUM 242-4-2-1-1-1-1, a short-duration paddy variety that matures in about 110 days, recommended for the Kuttanad region, and the procedures for its varietal release are currently in the pipeline.

Dairy development and animal husbandry

Dairy development constitutes an important pillar of the Kuttanad Special Package because livestock-based livelihoods provide crucial supplementary income for agrarian households struggling with the uncertainties of flood-prone agriculture. In addition to infrastructure expansion, dairy farmers in the Kuttanad region have benefited from State-supported milk procurement incentives. Assistance has been provided for the procurement of 1,116 cows, enabling farmers to diversify their livelihoods and mitigate agricultural risk. In Alappuzha District alone, subsidies for cows amount to Rs 19.9 lakh, reflecting the Government's effort to promote a shift toward integrated agri-livestock systems.

Parallel to these interventions, the Animal Husbandry Department has undertaken a series of infrastructure development projects to reinforce veterinary service delivery. Veterinary hospitals in regions such as Cherthala and Chethipuzha have undergone improvements, while facilities in Maniyamkulam, Vempuzha, and Kurichy are under construction. Several smaller facilities, including those in Perunna, Nogandassery, and Kanapuzha, have also received upgrades. Livestock Farmers Welfare issues have also been addressed through pension schemes and compensation packages. A total of 622 individuals have been brought under the Livestock Farmers' Pension Scheme. Furthermore, 1,349 livestock farmers have received compensation for crop damage and livestock deaths arising from floods and natural calamities. These interventions not only improve welfare but also strengthen the resilience of the rural economy by creating safety nets against unforeseen shocks.

The elevated community cattle shed at Chempumpuram, with a sanctioned amount of Rs 180 lakh, has been completed and inaugurated on May 12, 2022. The elevated community cattle shed at Champakulam, with a sanctioned amount of Rs 336 lakh has also been completed.

Together, these interventions demonstrate a multi-sectoral approach to strengthening livestock-based livelihoods in the floodplains. By combining physical infrastructure, capacity-building systems, procurement subsidies, and welfare mechanisms, the package has generated multiple layers of support for farmers who rely on mixed agricultural systems for income security.

Fisheries development and aquatic resource management

The fisheries sector forms an integral part of the socio-economic landscape of Kuttanad, particularly in areas adjacent to the Vembanad Lake, Pampa and Achenkovil rivers, and numerous canals. The Department of Fisheries has undertaken a major set of interventions aimed at improving fish production, restoring fish habitats, strengthening allied industries, and enhancing the incomes of small-scale fishing households.

One of the largest ongoing initiatives in the region has been the construction and renovation of fish landing and handling facilities. Another major intervention concerns the strengthening of the inland fisheries sector through the development of fish seed farms across various Blocks. These farms, located in Kuttanad's freshwater and brackish water zones, have expanded the availability of high-quality fish seed varieties suited to the region's unique hydrological conditions. The project has increased stocking levels in canals, rivers, and lake areas, enhancing overall fish production.

The Department has also implemented livelihood support schemes such as the distribution of modern fishing nets, fibreglass boats, and motorised engines. These programmes have improved the efficiency and

safety of fishing operations, especially in inland waters. Similarly, subsidies have been provided for the adoption of scientific aquaculture practices, including pen culture, cage culture, and integrated fish farming systems that combine aquaculture with paddy cultivation.

An important ecological component of fisheries development lies in the restoration of breeding habitats. Initiatives aimed at desilting and deepening specific river stretches, clearing aquatic weeds, and improving water circulation in canals have been implemented to enhance the natural regeneration of fish stocks. The Fisheries Department has also collaborated with scientific institutions to conduct studies on the declining populations of endemic species and has initiated pilot projects to reintroduce selected indigenous varieties.

Equally important are the social security measures introduced for fisherfolk. Insurance schemes and compensation packages have been extended to families who suffered losses due to the 2018 floods. Housing grants, livelihood rehabilitation programmes, and skill upgradation workshops form part of the Department's broader commitment to improving the socio-economic conditions of fishing families.

Through these initiatives, the fisheries component of the Kuttanad Package reflects a convergence of infrastructure modernisation, ecological regeneration, livelihood security, and scientific intervention.

Soil conservation and environmental management

Soil conservation is a foundational component of the Kuttanad development strategy, given that the region's agricultural productivity depends heavily on the stability of fragile below-sea-level soils. Recurrent flooding, prolonged waterlogging, salinity intrusions, and sediment disturbance from upstream flows constitute ongoing threats to soil structure. The Soil Conservation Department has implemented a number of interventions designed to counter these challenges, focusing on both structural and biological measures.

In the aftermath of the 2018 floods, several soil conservation works were sanctioned across multiple blocks in Kuttanad, particularly in areas where bund erosion, saline ingress, and bank failures had threatened crop viability. Engineers conducted technical assessments to identify bund segments requiring reinforcement through geotextiles, granite pitching, bioengineering methods, and vetiver planting. These works have helped stabilise vulnerable field boundaries and have reduced the risk of bund breaches during intense rainfall events.

In addition to bund protection, the Department has implemented slope stabilisation in canal-adjacent soils, with interventions involving deep compaction, controlled earth-filling, and planting of soil-binding species.

The Department also collaborated with research institutions to assess the post-flood changes in soil microstructure. These studies highlighted the presence of toxic sediments, including acidic sulphate layers, brought to the surface following flood-induced soil inversion in several paddy fields. Remediation measures — such as lime application, micronutrient enhancement, and soil reclamation treatments — were implemented to restore soil health in affected *padasekharams*.

Environmental management projects have also addressed the degradation of marshland ecosystems. Certain locations in Kuttanad have been identified as critical for avian biodiversity, and the Kuttanad Package has supported restoration programmes that involve clearing invasive weeds, reintroducing native wetland flora, and improving hydrological flows to ensure ecological balance. These measures reinforce the interconnectedness of soil health, ecological restoration, and sustainable agriculture.

Drinking water supply and sanitation

Ensuring adequate drinking water supply has long been a challenge in Kuttanad, where saline intrusion, shallow aquifers, and seasonal fluctuations affect water availability. Under the Kuttanad Special Package, the Kerala Water Authority (KWA) has implemented multiple projects focused on expanding potable water supply, modernising water treatment infrastructure, and extending pipelines to underserved regions.

One of the earliest interventions was the comprehensive drinking water project for the Alappuzha Municipality, which has achieved substantial completion. New pipelines have been laid across several divisions, and water treatment capacity enhancements have been undertaken to meet growing urban demand. The extension of distribution pipelines to various Panchayats, including Nedumudi, Kainakary, Pulinkunnu, Muttar, and Champakulam, has helped reduce the seasonal scarcity traditionally experienced in these areas.

In addition, the Kuttanad Regional Water Supply Scheme, one of the largest drinking water projects in the region, has been implemented with pipeline extensions and distribution-strengthening works. The project has entered its final phase with multiple overhead tanks, pumping stations, and transmission mains nearing completion. Improvements made to the raw water

intake facilities have enhanced the system's resilience during flood seasons.

Small-scale drinking water schemes have also been implemented through LSGs with technical support from KWA. Panchayat-level RO water purification units, water kiosks, and decentralised water treatment facilities have been established in regions where centralised supply networks face infrastructural constraints.

The Public Health Engineering division has, in parallel, undertaken sanitation-related works focusing on improving waste management and wastewater systems. Septage management facilities, mechanised cleaning systems for canals, and public sanitation complexes have been implemented in high-density settlements. These interventions help mitigate water contamination risks in a region where water stagnation during monsoons can amplify public health hazards.

Overall, the water supply and sanitation sector has seen notable improvements under the Kuttanad Package. The combination of centralised and decentralised water solutions, infrastructure modernisation, and enhanced service delivery has moved the region closer to achieving reliable and climate-resilient drinking water access.

Public works and transport infrastructure

Transport and road infrastructure development forms another major component of the Kuttanad Package, given that the region's waterlogged terrain and frequent flooding severely affect mobility. The Public Works Department (PWD) has undertaken a vast set of road-raising, culvert construction, bridge rehabilitation, and canal-side protection projects aimed at enhancing connectivity.

Major roads connecting Kuttanad's interior Panchayats, such as Nedumudi, Kavalam, Kumarakom, Pulinkunnu, Kainakary, Ramankary, and Thalavadi, have undergone improvements. Many of these sections, historically prone to submergence during monsoons, have been elevated and strengthened using geotextiles and concrete reinforcements. Several road stretches have also been widened to accommodate increased vehicular movement.

The construction of new bridges and the rehabilitation of old ones have improved connectivity between islands and mainland regions. Bridge projects in areas like Nedumudi–Kainakary and Kavalam–Pulinkunnu have reached advanced stages of completion. Culvert reconstruction in multiple localities has facilitated better water flow during floods while maintaining uninterrupted road access.

Interior roads passing through *padasekharams,* including bund roads, have been strengthened to ensure that agricultural machinery and emergency services can move even during peak flood periods. Panchayat-maintained rural roads have also received grants for resurfacing and side protection.

In addition, PWD has coordinated with the Water Resources Department to ensure that road construction does not obstruct natural drainage. Integrated planning has resulted in roads being designed with adequate drainage channels, culverts, and slope protections.

Through these measures, the transport sector interventions under the Kuttanad Package significantly enhance regional mobility, reduce isolation during floods, and support agricultural transportation and market access.

The PWD is implementing the Alappuzha–Changanassery road development as a semi-elevated highway project. The project aims to provide year-round connectivity and reduce flood-related disruptions in the region. As of December 2025, around 95 per cent of the work has been completed.

Industries and cooperation

The industrial component of the Kuttanad Package focuses primarily on revitalising small and medium enterprises (SMEs), supporting cooperative institutions, and promoting employment-generating activities for rural populations. The Department of Industries has facilitated the establishment of new MSMEs and provided support for modernising existing enterprises. Industrial units operating in agro-processing, coir, handicrafts, and food production have been extended subsidies, credit support, and technology upgradation assistance.

An important initiative is the establishment of the Integrated Rice Park in Chengannur – under the public company, the Kerala Rice Limited. For this, KINFRA has registered 5.2 acres of land of Prabhuram Mills under the Kerala State Textile Corporation. The cost of this project is estimated at Rs 66 crore. Land acquisition has been completed, and construction of buildings for administrative work and canteen construction is in progress.

Cooperative societies, including primary agricultural societies, credit societies, and women's cooperatives, have implemented projects intended to support livelihoods in flood-affected areas. These include procurement centres for agricultural produce, value addition units, and cooperative-run service facilities. Special financing arrangements were extended

to societies that experienced asset damage during the floods.

Through these interventions, the industries and cooperation sectors contribute to diversifying income sources and building resilience against agricultural uncertainties.

Power supply

The Kerala State Electricity Board (KSEB) has implemented numerous works aimed at strengthening electrical infrastructure in the Kuttanad region. Several new transformers have been installed, distribution lines have been restructured, and sub-stations have undergone renovation to ensure uninterrupted power supply even during adverse weather conditions.

Another long-standing demand of the people of Kuttanad is an electricity sub-station in Kuttanad itself. The work of electricity sub-stations in Kidangara, Kavalam and Kuttanad is in progress. The required land (32 cents) in Kidangara was acquired in January 2023. The work of the sub-station, which started in June 2023, is 70 per cent complete, and is expected to be fully completed in 2025-26. It is expected that the sub-stations in Kavalam and Kuttanad will be completed and commissioned within two years. The land acquisition work related to the Kavalam sub-station work has not been completed. The initial work related to the construction of the substation, such as preparation of estimates, layout, etc., has been completed. The construction work is 56 per cent complete. The work related to upgrading the substation in Kuttanad to 110 KV is 50 per cent complete. It is expected to be completed by 2026.

Flood-related damage to electrical networks has been addressed through the replacement of poles, upgrading of low-lying transformers, and raising of distribution boxes. High-tension and low-tension lines that pass through vulnerable zones have been insulated or rerouted where necessary.

KSEB has also participated in inter-departmental meetings to synchronise power distribution schedules with agricultural operations, especially during paddy cultivation periods when uninterrupted supply is essential for the functioning of pump houses.

Social justice and welfare

Across Kuttanad, socially marginalised communities — especially Scheduled Caste households, fisherfolk, widows, and disabled individuals — have received targeted support under various welfare departments. Housing reconstruction assistance, social security pensions, disability grants, and livelihood rehabilitation packages have been implemented widely.

The Department of Social Justice has carried out infrastructure works in SC/ST nagars, including the construction of community halls, sanitation units, public water points, and smart anganwadis at Thalavadi, Veliyanad, Neelamperoor, Ramankari, and Cheruthana. Post-flood rehabilitation grants have been disbursed to eligible families, and vocational training programmes have been organised for women and youth.

These welfare measures embody the equity-oriented dimension of the Kuttanad Package and reflect the State's commitment to social inclusion in disaster recovery processes.

Health infrastructure and public health systems

The Health Department has undertaken improvements across Primary Health Centres, Family Health Centres, and Community Health Centres in the Kuttanad region. These include building renovations, maternity ward upgrades, installation of diagnostic equipment, and improvements to outpatient and inpatient facilities. The Pulikunnu Taluk Hospital Development Project has been sanctioned under KIIFB with an outlay of Rs 144.1 crore.

Several health centres vulnerable to flooding — such as those in Kainakary, Nedumudi, and Pulinkunnu — have undergone structural strengthening to ensure uninterrupted functioning during monsoons. Mobile medical units have been introduced in remote areas to improve access for elderly and chronically ill individuals.

Vector-control activities have been intensified, especially in regions where water stagnation increases the risk of mosquito-borne diseases. Public health campaigns have been undertaken in collaboration with schools, local bodies, and community organisations.

Education

Education projects in Kuttanad have spanned from repairing flood-damaged school buildings to upgrading existing institutions with modern facilities. School campuses that had been severely affected by waterlogging received substantial reconstruction funds. These works involved raising classroom floors, repairing compound walls, rebuilding laboratories, upgrading sanitation blocks, and enhancing drinking water facilities.

Higher Secondary schools in Kainakary, Nedumudi, Champakulam, and Ramankary have benefited from new classroom blocks and improvements in science laboratories. Some of these schools, historically prone to monsoon flooding, were provided with elevated

platforms for laboratories and office rooms. Government Upper Primary Schools in remote water-surrounded villages received funds for improved playgrounds, compound protection, and electrification.

Technical education institutions in Kuttanad also received support for equipment modernisation and laboratory upgrades, enhancing their capacity to offer skill-development programmes aligned with local needs. In addition, hostel facilities for students — especially those residing in interior islands — were improved to ensure safe and accessible accommodation during monsoon seasons.

Revenue, land management, and disaster response

The Revenue Department played a crucial role in disaster response and rehabilitation efforts in the immediate aftermath of the 2018 floods and subsequent climatic disturbances. Land records of thousands of households were damaged or lost during the floods, prompting a region-wide effort to reconstruct, digitise, and secure land documentation. As a result, land resurvey and digital record-building exercises were expedited under the Package, ensuring that affected households regained legal clarity over property ownership.

Compensation distribution formed another central responsibility of the Revenue Department. Flood-affected households received financial aid for house repairs, loss of agricultural equipment, and damage to stored produce. Administrative machinery was mobilised to verify claims, conduct site inspections, and process payments in a timely manner. The Department also coordinated with the Agriculture and Animal Husbandry Departments to ensure that compensation reached farmers who suffered losses in crops, livestock, and agricultural implements.

In terms of disaster preparedness, the Revenue Department facilitated the construction of multipurpose cyclone and flood shelters in high-risk areas. Training programmes in disaster response, involving local volunteers and LSG representatives, were organised to strengthen community resilience. The Department also collaborated with the Water Resources Department to improve flood forecasting, advance warning systems, and evacuation pathways.

Land management improvements also included the rectification of encroachments along key waterways. In consultation with Village Offices and the Water Resources Department, several encroached canal banks were cleared to improve drainage efficiency. These coordinated actions underscored the interdependence of land governance and hydrological management in a flood-prone region.

Local Self-Government and decentralised planning

LSGs across Kuttanad — Grama Panchayats, Block Panchayats, and Municipalities — have played a central role in implementing decentralised projects funded through Plan grants as well as special allocations under the Kuttanad Package. Their contributions span road improvements, sanitation, drinking water systems, small-scale pumping schemes, canal cleaning, bund strengthening, and community infrastructure works.

Block Panchayats have coordinated multi-ward projects affecting multiple *padasekharams*. Gram Panchayats have implemented sluice repairs, canal desilting, bund maintenance, and village-level water supply expansions. Municipalities have focused on urban sanitation, solid waste management, and stormwater drainage.

Administrative coordination and governance architecture

The Kuttanad Package represents one of the most complex inter-departmental development efforts undertaken in Kerala, involving a coordination network spanning more than fifteen major Departments, multiple public sector agencies, LSGs, and specialised scientific bodies. The State Planning Board functioned as the central coordinating authority, ensuring that departmental actions aligned with ecological realities and long-term development objectives.

Frequent coordination meetings were held between the Water Resources Department, Agriculture Department, Revenue Department, Animal Husbandry, Public Works, KWA, Fisheries, and LSG representatives. These meetings facilitated the resolution of administrative bottlenecks, alignment of work schedules, and harmonisation of infrastructural plans. In many cases, joint inspections were carried out by multi-department teams to ensure that infrastructural works did not conflict with each other-for example, ensuring that road-raising works did not impede drainage, or that canal desilting works were synchronised with paddy cultivation cycles.

The Rebuild Kerala Initiative (RKI) served as a catalyst for project restructuring and approval, particularly for technically complex projects that required expert validation. Institutions such as IIT Madras, CWPRS Pune, and agricultural research centres provided scientific advice for river morphology studies, hydrological modelling, and paddy ecosystem restoration.

This integrated administrative framework represents a significant advance in the governance of large-scale environmental and infrastructural projects in Kerala.

Concluding assessment

The Kuttanad Special Package represents one of the most extensive and multisectoral development interventions undertaken in Kerala in recent decades. Its breadth reflects the ecological and socio-economic complexity of the region. Covering water resources, agriculture, fisheries, transport, drinking water, sanitation, industry, social welfare, and public health, the package operates at the intersection of environmental management, livelihood security, and infrastructural resilience.

Several thematic conclusions emerge from the detailed review presented in this chapter. First, the water-resource-centric interventions form the foundational layer of the package and are indispensable for ensuring that all other sectors can thrive. The extensive investments in flood control, desilting, riverbank stabilisation, and lake restoration underscore the recognition that hydrological stability is the precondition for sustainable development in below-sea-level farming systems.

Second, agricultural and ecological interventions reflect a long-term vision to secure the livelihoods of farming communities. The emphasis on sustainable paddy ecosystem management, integrated farming, mechanisation support, and scientific research integration represents a forward-looking strategy that acknowledges both traditional knowledge and modern agronomic advances.

Third, livelihood diversification through dairy, fisheries, MSMEs, tourism, and cooperative development strengthens the region's socio-economic fabric. These sectors provide critical buffers against the uncertainties inherent in waterlogged agricultural landscapes.

Fourth, improvements in health, education, social infrastructure, and local governance reinforce the human development aspects of the Package. Investments in health centres, schools, and welfare institutions help build community resilience and strengthen social security mechanisms.

Finally, the administrative and governance architecture of the Kuttanad Package highlights the importance of coordinated, multi-departmental planning for complex ecological regions. The experience gained through this initiative offers valuable lessons for designing climate-resilient development frameworks in other parts of Kerala and beyond.

Overall, the Kuttanad Special Package represents an integrated development paradigm that seeks to harmonise ecological restoration, economic resilience, infrastructural modernisation, and social development. Its implementation over the last several years reflects both the challenges and the possibilities inherent in managing a hydrologically dynamic, agriculturally rich, and ecologically sensitive landscape.

Chapter 29
Good Governance Initiatives

Since 2016, the State has implemented a wide range of initiatives that combine technological innovation and administrative reform. These initiatives aim at making government more citizen-centric, transparent, and efficient. Most of these initiatives have been discussed in preceding chapters; some major programmes of a general nature are outlined below.

Administrative Reforms Commission

A significant measure of the Government of Kerala's commitment to improving governance was the constitution of the Fourth Administrative Reforms Commission (ARC) in August 2016. Chaired by former Chief Minister V. S. Achuthanandan, the Commission was tasked with recommending comprehensive reforms to enhance transparency, efficiency, and overall governance in public administration. It examined key issues such as bureaucratic delays, corruption, public service delivery, and the functioning of Government departments and Local Self-Governments. The Commission submitted 13 reports containing recommendations to strengthen accountability, simplify procedures, promote citizen-centric governance, and curb corruption. The Fourth ARC played a significant role in shaping discussions on administrative modernisation and good governance in Kerala. Subsequently, a Committee at the level of the Chief Secretary was constituted to examine the Commission's reports and submit recommendations. Five of the Commission's reports have been approved and implemented, while the remaining reports are under consideration.

Consultative Governance

Several innovative programmes have been introduced to strengthen participatory decision-making by actively engaging citizens, experts, and other stakeholders, thereby ensuring that policies are inclusive, transparent, and responsive to public needs.

Navakerala Sadas. This is a flagship public outreach programme of the Government of Kerala aimed at strengthening social accountability and democratising policy making through direct public engagement. From November 2023 to January 2024, the Chief Minister, along with Cabinet colleagues, visited all 140 Legislative Assembly constituencies in the State. During these visits, the Government shared information on development and welfare activities undertaken in each area and put in place a special mechanism to receive complaints and suggestions from the public. The Chief Minister personally listened to grievances and suggestions from people across various sections of society and initiated steps to ensure their timely implementation. As a continuation of Navakerala Sadas, the Chief Minister held meetings with all Members of the Legislative Assembly (MLAs). Subsequently, an allocation of Rs 210 crore was earmarked in the Budget for 2025–26 as the first tranche for development projects that emerged from Navakerala Sadas. Under this initiative, projects costing up to Rs 7 crore per Assembly constituency can be undertaken.

Regional Review Meetings. These meetings have been organised at regular intervals to make Government services more accessible to the public and to ensure that development works are completed on time. These meetings also help identify and resolve issues that impede the progress of ongoing development activities in the Districts. In addition to the regional meetings, District-level review meetings and face-to-face (Mukhamukham) programmes with people from various sections of society have also been held.

CM with Me. The Government has also introduced a new citizen engagement initiative titled CM with Me (Mukhyamantri Ennodoppam). This Citizen Connect Centre is designed to enhance communication, gather feedback, and directly address public grievances through the Chief Minister's Office, thereby promoting more transparent, accountable, and responsive governance. Key features of the initiative include a structured grievance redressal system that guarantees feedback or a callback within 48 hours of lodging a complaint. The platform also provides easy access to reliable information on major welfare projects and other Government schemes, including housing, healthcare, and education. In addition, it facilitates active public participation by collecting and analysing citizen feedback on critical issues such as infrastructure development and environmental sustainability, and serves as a dependable mechanism for rapid Government support. A dedicated office with a two-layer call management system has been established in Thiruvananthapuram to operate the initiative on a 24/7 basis.

Citizen Services

Simplified certificate issuance. An important step has been the simplification of certificate issuance procedures to enhance convenience for citizens and improve transparency. This was achieved through a series of decisions aimed at reducing paperwork, expediting service delivery, and strengthening digital integration. The key simplifications undertaken in October 2021 include:

Universal validity. Certificates such as nativity and income are now accepted across multiple Government departments instead of being limited to a single specified purpose.

Reduced attestation requirements. In most cases, self-attested copies are accepted in place of attestations by gazetted officers or notaries.

Fee waivers and online delivery. Application fees have been waived for several services, with greater emphasis on online delivery and faster processing timelines.

Form rationalisation. Fields in application forms, such as changing "To be produced before" to "General," have been modified, and the "Purpose" field has been removed from several certificates.

Additionally, the Kerala Single Window Interface for Fast and Transparent Clearance (K-SWIFT), an online platform that streamlines the process of obtaining business licenses and permits, integrating multiple departments and providing time-bound digital approvals was established.

Total e-Governance Kerala (Sampoorna E-governance Keralam). In 2023, the State was declared to have achieved total e-governance coverage. Significant measures have been undertaken to make Government services widely accessible online, thereby eliminating the need for citizens to physically visit Government offices. In the Revenue Department, all certificates and related services have been fully digitised and made available through online platforms. A key feature of this digital governance framework is the e-SEVANAM and m-SEVANAM platform, which leverages technology to integrate nearly all online Government-to-Citizen (G2C) and Government-to-Business (G2B) services of the Government of Kerala into a single, unified platform for the benefit of citizens.

To strengthen public access to e-governance, the State declared internet access a basic right and launched the Kerala Fiber Optic Network (K-FON) project. Under this initiative, uninterrupted internet access has been ensured in Government offices, 2023 public Wi-Fi hotspots have been established at various locations, including transit stations and Government offices, and 20, lakh economically disadvantaged housesholds are being provided free internet.

Examples of the effective deployment of digital methods and e-governance include the digital land survey programme, and the computerisation of the Public Distribution System. Kerala's digital land survey programme, Ente Bhoomi (My Land) is a comprehensive digital resurvey of all villages in the State. It is complimented by the Integrated Land Information Management System (ILIMS) which delivers single-window access for citizens to all land-related services. Kerala has also effectively rolled out a fully computerised Public Distribution System (PDS) in which 94.3 lakh ration cards were digitised with beneficiary records stored in Unicode Malayalam. It also involved the end-to-end computerisation of the supply chain from Food Corporation of India (FCI) warehouses to Fair Price Shops (FPS), the creation of transparency portals supported by online grievance redressal facilities, the deployment of electronic Point of Sale (ePoS) devices at authorised retail outlets, SMS notifications on food grain availability, and the use of GPS-enabled vehicle tracking.

Kerala Chief Minister's (CM) Public Grievance Redressal System. The Kerala Chief Minister's Public Grievance Redressal System, known as Santhwanam and accessed through the Chief Minister's Office (CMO) portal, provides a streamlined, technology-driven mechanism for citizens to register and track complaints related to various Government offices and services. This integrated system, revamped in 2016, enables grievances to be submitted online from anywhere in the world, in person at the Secretariat's "Straight Forward" counter, or by post.

The portal is designed to make the civil service more people-friendly by consolidating earlier parallel grievance mechanisms into a single, effective platform. Complainants receive SMS and email notifications regarding the status of their petitions and can monitor progress online using a unique docket number or by calling the toll-free number 1076. The system prescribes a general timeframe of 15 days for the disposal of complaints and ensures that a detailed response is communicated to the petitioner upon resolution.

In addition, grievance redressal adalats at various levels and regular file-clearing campaigns have been conducted as integral components of the State

Government's administrative reforms and citizen-centric governance initiatives.

Legislative Interventions

Kerala Right to Public Services Act, 2025. A major initiative undertaken over the past decade to strengthen accountability is the Kerala Right to Public Services Act, 2025, which was notified in November 2025. The Act seeks to make the timely delivery of Government services a legal right for citizens by prescribing mandatory time limits for specified services. Its key provisions require every Government department to designate responsible officers, automate acknowledgements for online applications, and publicly disseminate information on available services, along with relevant contact details. To ensure compliance and transparency, the Act establishes a formal grievance redressal mechanism and empowers appellate authorities and the Kerala State Right to Service Commission with civil court powers to penalise defaulting officials.

Repeal of Obsolete Laws. The Kerala Repeal and Abolition Bill, 2021, which sought to repeal 105 obsolete Acts, was passed by the Legislative Assembly on 23.08.2022, and the Kerala Repeal and Abolition Act came into force on 13.09.2022. Subsequently, based on the recommendations of the Kerala Law Reforms Commission headed by Justice J K T Thomas, 110 amendment Acts were repealed through the Kerala Repeal and Abolition Act, 2024.

Departments Reorganisation and Good Governance

As part of its commitment to good governance and effective service delivery, the Government of Kerala has, over the past decade, created new departments and reorganised existing ones. Some of the prominent initiatives in this regard are outlined below.

Women and Child Development Department. A dedicated Department for Women and Child Development (WCD) was established in 2017 by carving it out of the erstwhile Social Justice Department. This step fulfilled a key promise in the LDF manifesto to create a specialised institutional mechanism for women's empowerment and child welfare, responding to long-standing demands for focused attention on gender issues and holistic development. The new Department brought various women-centric institutions under a single umbrella, thereby improving coordination and policy implementation.

Local Self-Government Department. The Local Self-Government Department (LSGD) was reorganised in 2022 by bringing together five key Departments — Panchayat, Rural Development, Urban Affairs, the LSGD Engineering Wing, and Kerala Town and Country Planning — under a unified administrative framework through the creation of a Principal Directorate for the LSGD Common Service. This reform was intended to deepen decentralisation, streamline service delivery, and improve administrative efficiency by addressing coordination challenges and establishing an integrated service system to support more effective local governance and development across the State.

General Education Department. In 2019, the general education sector underwent comprehensive restructuring with the creation of the Directorate of General Education (DGE). This reform merged school education functions previously managed by the Directorate of Public Instruction (DPI) and brought Higher Secondary Education (DHSE) and Vocational Higher Secondary Education (DVHSE) under a unified administrative framework. The consolidation aimed to enhance coordination and operational efficiency by placing all school-level activities from primary education to Plus Two, including examinations, under a single authority.

PIEMD. In 2021, the Government established the Programme Implementation, Evaluation, and Monitoring Department (PIEMD) within the Government Secretariat, based on the recommendations of Kerala's Fourth Administrative Reforms Commission (ARC). The Department was created by integrating the roles and functions of the earlier Central Plan Monitoring (CPM) unit that functioned under the Planning and Economic Affairs Department, with the objective of establishing a more streamlined and effective mechanism for overseeing Government programmes. PIEMD has also been entrusted with the responsibility of tracking progress towards the Sustainable Development Goals (SDGs) in the State.

Personnel interventions. The Government of Kerala also established its prestigious civil service, the Kerala Administrative Service (KAS), to recruit skilled administrators for key roles within the State Government. Modelled on the Indian Administrative Service (IAS), KAS provides a pathway for successful officers to potentially join the All India IAS cadre later in their careers. The primary objective of KAS is to build a strong second line of managerial talent, thereby ensuring effective policy implementation and efficient functioning of State administration across departments. The first batch of 104 KAS officers has completed one

and a half years of training and is currently serving in various departments. The Public Service Commission (PSC) has issued a notification for the second phase of KAS recruitment.

Over the past decade, the Government of Kerala has created more than 32,000 new posts to strengthen public service delivery. A significant proportion of these positions were created in service delivery departments, particularly the Health Department, with the objective of improving efficiency and service quality.

e-Governance. To enhance transparency, speed, and administrative efficiency, the e-Office system has been implemented across all Departments, enabling inter-office digital file movement and the use of official email systems.

Clear transfer norms have been laid down for employees, and departments have adopted online transfer portals to ensure a more efficient and transparent transfer process.

Financial Management

PlanSpace. PlanSpace is an e-governance initiative of the Kerala State Planning Board designed to support the complete life cycle of Plan schemes, from formulation and approval to implementation, monitoring, and evaluation. Building on this foundation, the Board launched PlanSpace 2.0 as an upgraded and robust tool that enhances governance and public oversight through a comprehensive digital dashboard.

PlanSpace 2.0 provides a common digital workspace for all stakeholders involved in planning and implementation. It has been extended to the sub-District and District levels, enabling the capture and monitoring of both physical and financial progress of Plan schemes implemented across multiple administrative tiers, from State to Local Self-Government. A key strength of PlanSpace 2.0 lies in its advanced analytical and reporting capabilities, powered by dynamic dashboards, performance indicators, and data-visualisation tools. Moreover, it provides geo-tagged project data, enabling accurate tracking of assets and works on the ground.

Transparency in Chief Minister's Distress Relief Fund. Since 2016, the Government has implemented numerous measures to enhance the efficiency of the Chief Minister's Distress Relief Fund (CMDRF). The distribution of financial assistance is now carried out in a transparent and timely manner, completely eliminating the need for the general public to visit government offices to obtain assistance. The entire process — from submission of applications to the receipt of financial assistance — has been made more transparent and streamlined through complete digitisation and clearly defined financial regulations. The system is now fully web-managed, enabling public scrutiny under the Right to Information (RTI) Act.

A structured framework of financial delegation has been introduced, with specific sanctioning limits prescribed for the District Collector, Revenue Secretary, Revenue Minister, and the Chief Minister, while cases exceeding these limits are placed before the Council of Ministers. To ensure operational accountability, funds are transferred directly to beneficiaries through a direct bank transfer mechanism. Furthermore, the budgeting and expenditure of the fund are subject to regular audits by the State Legislature and the Comptroller and Accountant General.

Accountable, Accessible, and Citizen-Friendly Local Self-Governments

LSGs in Kerala play a pivotal role in delivering critical services to the people by ensuring effective provision of basic amenities, social welfare programmes, and responsive grassroots-level governance. The Government has significantly empowered LSGs, allocating substantial to transform them into "true local governments" responsible for grassroots development and public action. Further, several measures have been taken to make them more accountable, accessible, and people-friendly.

Grassroots service delivery has been strengthened through the K-SMART platform, enabling efficient and accessible online services across Gram Panchayats, Municipalities, and Municipal Corporations. By integrating previously fragmented governance tools into a unified digital platform, K-SMART streamlines regulatory processes using advanced technologies. Notably, the AI-enabled, GIS-based Electronic Development Control Regulations (EDCR) Rule Engine has transformed the building permit process by reducing approval times from months to minutes or even seconds. All financial transactions between citizens and local governments have been fully digitised, enabling quick and secure online payments, while GIS-based initiatives such as "Know Your Land" provide instant access to land-use information.

Over 600 LSG services have been migrated to K-SMART, allowing citizens to access services via mobile devices without visiting offices. The platform has significantly simplified civil registration processes, with birth and death certificates issued within minutes

and marriage registration enabled remotely through a pioneering Video KYC system.

Strengthening Anti-Corruption Measures

The Government continues to adopt an uncompromising stance to eliminate corruption at all levels through effective use of e-governance, e-tendering, social audits, legal awareness, and a robust vigilance system. E-tendering and e-procurement have been made mandatory, and the Union Government's Government e-Marketplace (GeM) platform is also being utilised.

The Vigilance and Anti-Corruption Bureau has launched the Corruption-Free Kerala campaign, encouraging public participation as part of the Government's Zero Tolerance to Corruption policy. The initiative aims to identify and eliminate sources of corruption in Government, semi-Government, and public sector institutions.

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