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Finance Department
Government of Kerala

ENVIRONMENT
BUDGET 2024-2025

KERALA ENVIRONMENT BUDGET

Government of Kerala

FOREWORD

The Government of Kerala has been recognized for its success in achieving high levels of human resource development along with prioritization of environmental sustainability in its policies and programmes. Kerala, among the larger states is the second best performer on the State Energy and Climate Index released by NITI Aayog. The State has set itself a goal to become Net Carbon Neutral State by 2050 in accordance with NDC. Kerala Solid Waste Management Scheme, Kerala Climate Resilient Agri Value Chain Modernization project (KERA), Bio diversity conservation programs, e-mobility scheme etc are some of State's prestigious environment friendly schemes in plan budget. The involvement of local self-governments in this endeavour is also remarkable. The Perinjanam model household rooftop solar panels and carbon neutral efforts of Meenangadi are examples for the widely appreciated efforts in national level by our LSGIs.

The State's concern in environmental impacts/sustainability is a long term commitment in decision making along with economic and social considerations. Our State, due to its geographical location at the western coast and the steep gradient of the Western Ghats, is ecologically fragile and is highly susceptible to natural disasters and the impacts of climate change. The unprecedented flood in 2018 & 2019 and its catastrophic effects in terms of loss of lives, lively- hood and wide spread damages of infrastructure affected a large segment of our population and shook the economy of the State. This necessitated a sustainable environment resilient approach in planning and programme implementation. With this perspective, Kerala announced the launch of 'Environment Budget' to observe environment friendly green protocol in financial management and ensure transparency & credibility in the initiative towards environmental programmes and policies of the State.

The environment is a complex system that is interconnected with many aspects of our lives. It involves understanding that environmental problems are not just about pollution or conservation but also about socio economic and cultural factors that influence our relation with the nature.

Different countries and organisations adopted various types of methodologies for addressing their environmental concerns. Kerala's Environment Budget aims to promote environmental sustainability, effective utilisation of resources, enhance transparency and accountability and facilitating policy integration. It focuses on categorizing environment related expenditure in the State's budget based on its significance on different environmental dimensions.

This is a novel initiative towards State's commitment on integrating environmental concerns to its planning & implementation and will be refined in coming years. In the first year environment friendly schemes from the selected plan sectors are chosen. I hope this would be helpful to a great extent for mainstreaming the environmental awareness and for an assessment of expenditure relevant to environment.

K N BALAGOPAL

Minister for Finance

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List of Acronyms & Abbreviations

ANERT	Agency for New and Renewable Energy Research and Technology
COP	Conference of the Parties
DoECC	Directorate of Environment & Climate Change
EPR	Extended Producer Responsibility
EMC	Energy Management Centre
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIM	Green India Mission
KWA	Kerala Water Authority
KEB	Kerala Environment Budget
KMRL	Kochi Metro Rail Limited
LiFE	Lifestyle for Environment
LT-LEDS	Long Term – Low Emission Development Strategy
MoEFCC	Ministry of Environment, Forest and Climate Change
NCAP	National Clean Air Programme
NAPCC	National Action Plan on Climate Change
NDC	Nationally Determined Contribution
NEMMP	National Electric Mobility Mission Plan
PM	Particulate Matter
PMUY	Pradhan Mantri Ujjwala Yojana
PFM	Public Financial Management
SBSAP	State Biodiversity Strategy and Action Plan
SAPCC	State Action Plan on Climate Change
SDG	Sustainable Development Goal
UNFCC	United Nations Framework Convention on Climate Change
NBS	Nature Based Solutions
CITA	Co-operative Initiative in Technology Driven Agriculture
KSREC	Kerala State Remote Sensing and Environment Centre
KSEBL	Kerala State Electricity Board Ltd.
IPCC	Intergovernmental Panel on Climate Change
NCCR	National Centre for Coastal Research

Executive Summary

Kerala has been recognized for its success in achieving high levels of human development along with prioritisation of environmental sustainability. Kerala has already adopted the United Nations Sustainable Development Goals (SDGs) for its development planning and aligned its policies and programs with a focus on sustainable economic growth, social development, and environmental sustainability. Kerala is the second best performer among the larger states on the State Energy and Climate Index released by NITI Aayog.

The State has made significant strides in promoting sustainable development in various sectors such as agriculture, livestock, fisheries, water resources, health, forest and biodiversity, environment and climate change, tourism, energy and transportation, industry, etc. by integrating environmental, economic, and social considerations into development planning as mentioned. State's concern in environmental impacts/sustainability in decision making along with economic and social considerations is a long term commitment for which a proper framework to be evolved. Realising this, the Hon. Finance Minister in his Budget Speech 2022 had announced the launch of 'Environment Budget' document in order to observe environment friendly green protocol in financial management and ensure transparency and credibility in the initiatives towards environmental programs and policies of the state.

The Kerala Environment Budget is a novel initiative aimed at promoting sustainable development of the State by taking into account the environmental concern and policies in its planning, promotion and implementation areas. This is an evolving one and will be refined in alignment with the challenges being faced, lessons learned from the experience and through the feedback from experts. As a first step an analysis is done by selecting schemes from environment sensitive areas that have positive impact on the environment. 81 plan schemes under the following sectors are selected for identifying the scheme wise environment component involved in it in this year.

- Agriculture
- Livestock
- Fisheries
- Forests and Wildlife
- Environment
- Water Resources
- Co-operation
- Soil Survey
- Energy Sector

The dimension would be widened and also this exercise would be extended to more departments and non plan schemes in coming years.

CHAPTER I
KERALA ENVIRONMENT BUDGET

1.1 Introduction

Environmental budgeting of the State refers to the process of evaluating environmental impacts of budgetary and fiscal policies and to integrate environmental concerns into the policies and programmes of the State. It is an important tool for mainstreaming the environmental awareness and to assess the effectiveness of Government spending in this area through various schemes under different sectors. The process typically involves setting targets, identifying priority areas and activities, estimating costs, and allocating funds based on the available resources and the expected environmental outcomes.

Environment Budgeting can assist governments in promoting sustainable development and achieving environmental goals and helps to improve transparency, accountability, and stakeholder participation in decision-making. It contributes to ensuring that environmental expenditures are properly accounted for and reported on, and that they are in line with the overall goals and objectives of state or national environmental policies and strategies.

Several countries conduct Environment Budget Framework to track and monitor government spending on environmental sustainability initiatives. Some examples are United States, Canada, United Kingdom, France, Australia, New Zealand, etc. Overall, environmental budgeting is an essential component of environmental governance and a critical tool for achieving sustainability in development.

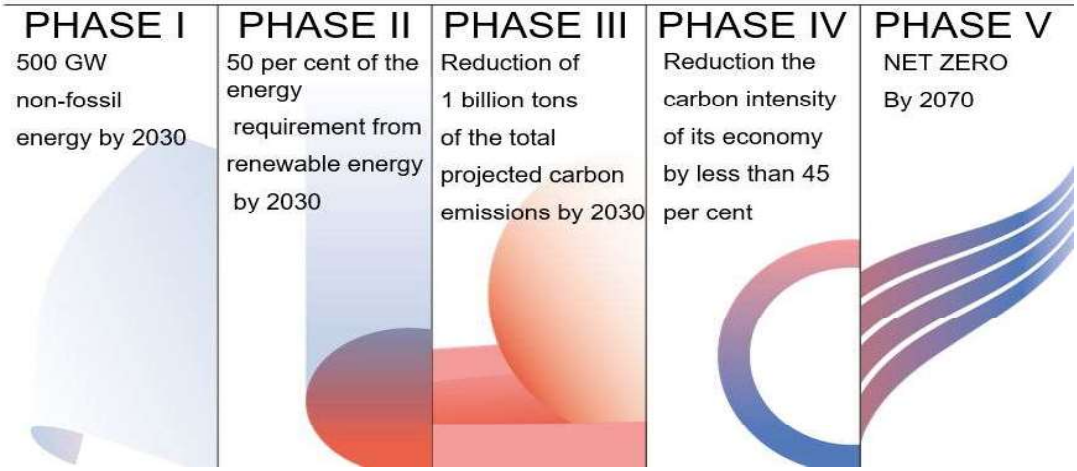
Environment Budgeting can play a crucial role in developing countries due to the significant environmental challenges they face, such as deforestation, pollution, climate change, waste management etc. Therefore, environment budgeting becomes necessary to prioritize their spending on environmental protection and sustainable development projects. Additionally, many developing countries have pledged to international agreements and protocols that mandate them to

safeguard the environment and promote sustainable development. Environment budgeting can guarantee the allocation of funds towards achieving these commitments, which, in turn, can contribute to economic growth and poverty reduction through sustainable development and environmental protection.

1.2 India's Initiatives on Environmental Sustainability

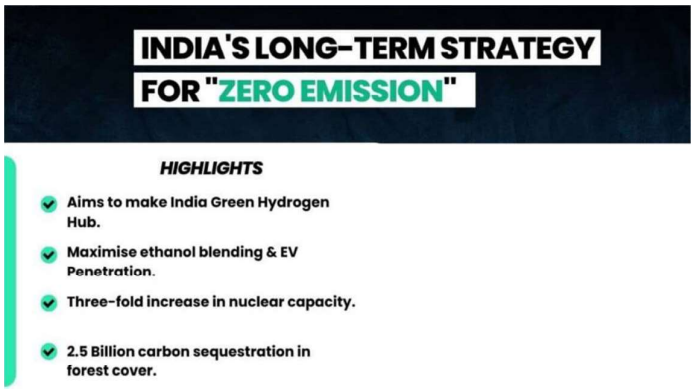
Environmental sustainability in India is a crucial issue given the country's rapidly growing population and expanding economy. Some of the key environmental challenges facing our country and the efforts being made towards sustainability are follows:

Climate Change: The country is highly vulnerable to the impacts of climate change, including increased frequency of extreme weather events such as floods and droughts. India is a signatory to the Paris Agreement on Climate Change and has committed to reducing its greenhouse gas emissions intensity of GDP. As a developing country, India faces the challenge of pursuing development while balancing and maintaining these climate change commitments. Nevertheless, the Government of India also submitted its Nationally Determined Contributions (NDC) goals and targets in 2015. The NDC comprised eight goals; three of these have quantitative targets up to 2030 namely, cumulative electric power installed capacity from non-fossil sources to reach 40%; reduce the emissions intensity of GDP by 33 to 35 percent compared to 2005 levels and creation of additional carbon sink of 2.5 to 3 billion tonnes of CO_2 equivalent through additional forest and tree cover. At the COP26, India expressed to intensify its climate action by presenting five nectar elements (Panchamrit) of India's climate action and announced its intent to attain Net Zero Emission by 2070 and proposed Lifestyle for Environment (LiFE). At COP27, India presented its Long-Term Low Emission Growth Strategy, as well as its intention to embark on a low-carbon transition path.



Lifestyle for Environment (LiFE): The MoEFCC's LiFE program is a national campaign aimed at promoting sustainable lifestyles and environmentally friendly behaviour among individuals and households across India. The program focuses on raising awareness about the environmental impact of individual behaviours and promoting sustainable living practices through a range of initiatives, including public awareness campaigns, educational programs, and policy interventions.

Long-Term Low-Emission Development Strategy: India's Long-Term Low-Emission Development Strategy (LT-LEDS) is a national plan developed by the Government of India to promote sustainable development and combat climate change. The strategy aims to identify long-term pathways for economic growth and development while reducing greenhouse gas (GHG) emissions and enhancing the country's resilience to climate change. The LT-LEDS is based on three pillars: (i) Decarbonisation; (ii) Adaptation; (iii) Sustainable Development. The LT-LEDS is aligned with India's commitments under the Paris Agreement on climate change, as well as the United Nations Sustainable Development Goals.



The government has launched the National Action Plan on Climate Change (NAPCC), which includes initiatives to promote renewable energy and energy efficiency, as well as efforts to promote sustainable agriculture. Further, NAPCC also advocates the formulation and implementation of State Action Plan on Climate Change (SAPCCs).

Waste Management: Large amount of solid waste are generating in the country, much of which is not properly managed, leading to environmental and health problems. The government has launched the Swachh Bharat Abhiyan campaign in 2014 to promote cleanliness and proper waste management.

Air Pollution: India's major cities suffer from high levels of air pollution, primarily caused by transportation and industrial activities. The government has launched initiatives such as the National Clean Air Programme in January 2019, NCAP is a long-term, comprehensive strategy to improve air quality in India. The program aims to reduce particulate matter (PM) pollution by 20-30% in 102 cities by 2024. Pradhan Mantri Ujjwala Yojana (PMUY) launched in 2016 aims to provide clean cooking fuel to poor households in rural areas, which may reduce the indoor air pollution caused by traditional cooking fuels like firewood and cow dung. Electric Mobility Mission Plan (NEMMP) launched in 2013, aims to promote the use of electric vehicles and to reduce the carbon footprint of the transportation sector.

Biodiversity Conservation: India is home to a diverse range of flora and fauna, but is facing the loss of many species due to habitat destruction and climate change. The government has launched initiatives such as the National Biodiversity Act and the National Biodiversity Mission to protect and conserve India's biodiversity. The Green India Mission (GIM) launched in 2014 aims to increase India's forest cover and improve the quality of existing forests by promoting afforestation, reforestation and forest conservation. The program aims to increase India's forest cover from 21.34% to 33% of its geographical area.

Water Sustainability: India is facing severe water scarcity in many regions due to overuse and pollution of water resources. The government has launched the

National Water Mission in 2011 with the aim of conserving water, minimizing wastage and ensuring equitable distribution of water across the country, Jal Jeevan Mission in 2019 to provide safe drinking water to all households in the country by 2024 and the Atal Bhujal Yojana in 2020 to improve groundwater management in priority areas of the country

1.3 Environmental sustainability within the development process of Kerala State

Kerala is the second-best performer among the larger states on the State Energy and Climate Index released by the NITI Aayog that ranks states based on improved energy access, energy consumption, energy efficiency, and safeguarding the environment. By prioritizing sustainability, Kerala has been able to achieve high levels of human development while also preserving its natural resources for future generations.

Kerala has adopted the United Nations Sustainable Development Goals (SDGs) for its development planning. The state has aligned its policies and programs with the SDGs, with a focus on sustainable economic growth, social development, and environmental sustainability. Kerala has been an early adopter of the United Nations' Sustainable Development Goals (SDGs) and has aligned its development policies with these goals. The state has integrated the SDGs into its Five-Year Plans and has set up a State-Level SDG Monitoring and Coordination Committee to oversee the implementation of these goals.

The State has made significant strides in promoting sustainable development in various sectors, including agriculture, livestock, fisheries, water resources, health, forest and biodiversity, environment and climate change, tourism, energy and transportation, industry, etc. by integrating environmental, economic, and social considerations into development planning. Kerala state has implemented several initiatives to mainstream environmental sustainability within the development process. Some of these initiatives include:

1. ***Kerala State Action Plan on Climate Change (SAPCC)***: The Directorate of Environment and Climate Change has prepared the first State Action Plan on Climate Change (SAPCC) in 2014 to address the challenges of climate change in the state. The Directorate of Environment and Climate Change has prepared the revised SAPCC 2.0 in December 2022, which identifies the state's vulnerabilities to climate change and outlines strategies and actions for mitigation and adaptation. The SAPCC includes measures to build climate resilience, reduce greenhouse gas emissions, increase the use of renewable energy, and promote sustainable development in the state. The Government of Kerala, aspires to become a Net Carbon Neutral State by 2050.

2. ***Haritha Keralam Mission:*** It is one of the four development missions launched by Government of Kerala in 2016 to promote environmental sustainability and conservation. It includes programs to promote waste management, organic farming, water conservation, Sanitation & social hygiene and biodiversity conservation etc.

3. ***Decentralised Waste Management***: The Suchitwa Mission under the Local Self Government Department provides technical assistance and support to local governments and community groups to implement decentralised waste management practices. The government has implemented a system of source segregation of waste at the household level, where citizens are encouraged

to segregate waste into different categories such as biodegradable, non-biodegradable, and hazardous waste. The Haritha Karma Sena collects the segregated waste from houses and establishments and hands over to waste recycling and managing centres or facilities like Clean Kerala Company.

4. ***Kerala Solid Waste Management Project (KSWMP)***: This is a joint intervention of the State and the Urban Local Bodies to enhance the capacity to address solid waste management issues. KSWMP is devised for waste management solutions and for setting up sewerage-septage treatment plants and sanitation infrastructure in urban areas as well as for ensuring its operation and maintenance. The project is implemented with the financial assistance of World Bank.

5. ***E-waste Management***: Kerala has implemented an e-waste management program to ensure the safe disposal of electronic waste. The state has established e-waste collection centers to manage electronic waste. The collected waste is recycled or disposed of in an environmentally sound manner. This includes setting up collection centers for e-waste and promoting the recycling of e-waste.

6. ***Plastic Waste Management***: Kerala has implemented a ban on the use of single-use plastic items such as carry bags, cups, and straws. This initiative aims to reduce the use of plastic and promote more sustainable alternatives. It has also set up plastic collection and recycling centres to manage plastic waste. The government is promoting the use of eco-friendly products and practices through several plastic-free campaigns.

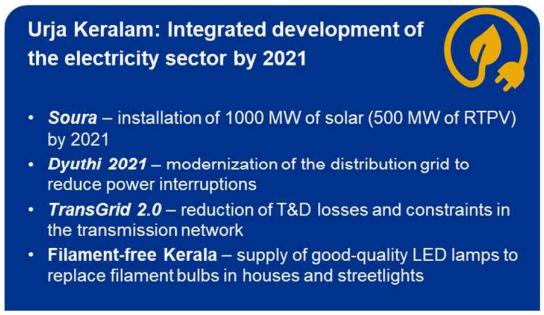
7. ***Green Protocol***: The state has introduced a Green Protocol to promote sustainable practices in various sectors, including tourism, education, and government offices. The protocol emphasizes the reduction of waste, energy conservation, and the use of renewable resources. The Green Protocol includes guidelines for waste management, energy conservation, and water conservation, among others.

8. ***Waste-to-Energy Projects***: Kerala has implemented several waste-to-energy projects to convert waste into energy. This includes biogas plants that generate electricity from organic waste, and waste-to-energy plants that use incineration technology to generate electricity from municipal solid waste.

9. ***Extended Producer Responsibility (EPR)***: Kerala has implemented an EPR program to promote the responsible disposal of waste by manufacturers and producers. This program requires producers to take back and recycle their products at the end of their life.

10. ***Water Supply and Sewerage***: Kerala Water Authority (KWA) and Jalanidhi are the two main agencies involved in the supply of drinking water in Kerala. Many urban and rural water supply/sewerage schemes are being implemented through Kerala Water Authority.

11. ***Clean Energy***: The State has implemented several programs to promote clean energy in the state, such as the "Kerala Solar Energy Policy," which aims to increase the use of solar energy in the state. The State also promotes the use of other clean energy sources such as wind, hydro, and biomass. The state has invested in solar and wind power projects and has encouraged the installation of rooftop solar panels on



buildings. “Urja Keralam Mission” launched by the State aimed at the integrated development of the electricity sector in the State.

12. ***Biodiversity Conservation***: Kerala has several initiatives to protect its rich biodiversity, including the establishment of protected areas, such as national parks and wildlife sanctuaries. The state has also implemented programs to conserve wetlands, forests, and marine ecosystems. The Kerala State Biodiversity Board has developed a State Biodiversity Strategy and Action Plan (SBSAP) to conserve its rich biodiversity and promote sustainable use of natural resources.

13. ***Sustainable Tourism Initiatives***: Kerala has developed eco-tourism destinations that promote sustainable tourism practices and support local communities. The state has also developed programs to educate tourists about the environment and encourage responsible tourism thereby minimizing the environmental impact of tourism activities.

14. ***Green Buildings***: Kerala has promoted the construction of green buildings, which are designed to be energy-efficient and eco-friendly. The state government has implemented several initiatives to promote the Energy Conservation Building Code for new constructions. These initiatives aim to promote sustainable building practices and reduce the carbon footprint of buildings.

15. ***Environmental Education and Public Awareness***: The state government has been conducting several awareness programs to educate the public on

environmental sustainability and pollution management. These programs aim to promote sustainable behaviour among the public and encourage them to adopt sustainable practices. The Directorate of Environment and Climate Change (DoECC) has launched the Bhoomithrasena Clubs for strengthening the environmental commitments of students at schools and colleges in the State. The Department also provides training and workshops for environmental management professionals to improve their skills. Projects like Vidyavanam, Nagaravanam etc. aims to develop different types of eco systems outside forest areas.

16. ***Sustainable Transport***: To bring back commuters to public transport, and to shift to environment friendly transport options, the Kerala government has drafted a few plans, policies, and projects. With its Integrated Transport System, the Kerala government aims to implement a seamless commuting network in cities across the State. This started with Kochi Metro as a pilot project (Urban Transport Initiatives of Government of Kerala, Kochi as a Pilot City, 2018). The Kochi Metro Rail Limited (KMRL) also prepared a city mobility plan. This Plan aimed at integrating all modes of transport, including non-motorized transport, light rail, metro, bus, water metro and intermediate public transport (autos and cabs/taxis).

    Kerala has also taken initiatives to boost electric mobility. The State has announced its Electric Vehicle (EV) Policy in 2019. The strategic initiatives planned in this regard are (1) Addressing the viability Gap, (2) Creating adequate charging infrastructure, (3) Promotion of local manufacturing, (4) Awareness creation and promotion, (5) Human capacity building and re-skilling.

Kerala has also launched a successful solar-powered passenger ferry operated between Vaikom and Thavanakadavu. This is the first commercially viable solar-powered passenger ferry in India. With these plans, policies, and projects to improvise the transportation sector, Kerala State is a front-runner in SDG 11 on Sustainable Cities and Communities, with 79 points.

17. ***Rebuild Kerala Initiative***: The Government of Kerala decided to transform the State's infrastructure into a green and resilient model after the floods of 2018. To implement this ambitious development objective, the Government established the Rebuild Kerala Initiative (RKI) to "bring about a perceptible change in the lives and livelihoods of its citizens by adopting higher standards of infrastructure for recovery and reconstruction, and to build ecological and technical safeguards so that the restructured assets could better withstand floods in the future". Under the RKI, Government took 11 initiatives to enhance the resilience of the state as part of the Rebuild Kerala Development Programme (RKDP). These initiatives cover multiple sectors like agriculture, roads, water, health, urban, coastal, environment and climate change etc.

These initiatives demonstrate the State's commitment to mainstreaming environmental sustainability within the developmental process. However, overall, mainstreaming of environmental sustainability in Kerala State requires a comprehensive and integrated approach involving various stakeholders and sectors. It requires a long-term commitment to sustainability and a willingness to prioritize environmental concerns alongside economic and social considerations in all aspects of decision-making. Realising this, the Hon. Finance Minister in the Budget Speech 2022 had announced the launch of 'Environment Budget' to

enhance budget credibility and transparency in public spending for environmental programmes and initiatives that ensures sustainable development.

> *"Kerala is committed to observe the environment friendly Green Protocols even in financial management. It is intended to ensure more transparency and credibility in connection with the measures against climate change. A document named 'Environment Budget' depicting the environment related expenses will be presented and by this Kerala will become a state that makes an important environment friendly advancement."*

1.4 Objectives of the Kerala Environment Budget

The Kerala Environment Budget (KEB) is a novel initiative aimed at promoting sustainable development in the State by linking budgetary allocations to specific environmental objectives / domains. The major objectives of Kerala Environment Budget are:

1. **Promoting environmental sustainability & effective utilisation of resources**: It aims to promote sustainable development in the Kerala by bringing environmental concerns in its planning & implementation and the fruitful utilization of resources set apart in various domains of environmental related activities as a part of state plan/non plan schemes.
2. **Increase the stakeholder participation & enhance transparency and accountability**: This helps to promote greater awareness of environmental issues and promotes transparency and accountability in the use of public resources, ensuring that expenditures are consistent with the overall goals and objectives of the state or national environmental policies and strategies.
3. **Facilitating Policy Integration**: It seeks to integrate environmental objectives into government decision-making processes, ensuring that environmental considerations are taken into account across all sectors of government.

Overall, the objective of an environmental budget is to ensure that environmental considerations are given due priority in the utilisation of public resources, and that the state or national environmental objectives are achieved. This is important for promoting sustainable development and ensuring a healthy and resilient environment for present and future generations.

CHAPTER II
MAJOR SECTORS AND METHODOLOGY

Environmental challenges pose a grave challenge to the sustainability of social and economic development, livelihoods of communities, and environmental management. Extreme climatic events are projected to increase, indicating changes in the magnitude, frequency, and timing of these events, all with implications for natural resource sectors such as fisheries, forests, water resources, and socio-economic systems such as agriculture and health and communities in various districts. In order to achieve better environmental resilience, the State needs to improve environment literacy and decentralized actions for adaptation and mitigation. As part of the Environment Budget for 2024-25, schemes are selected from environment sensitive areas that have positive impact on the environment.

2.1 Major Sectors Considered

Agriculture: Adaptation actions for the agriculture sector are aimed at improving climate resilience in agriculture through development and adoption of climate resilient and ecologically sustainable practises resulting in enhanced productivity and profitability along the value chain modernisation. They aim to enhance and climate-proof production practices, minimize post-production losses and build the capacities of supporting institutions and service providers such as Krishi Bhavans, markets, storage, credit, and insurance providers. Soil is the most important natural resource as far as agriculture is concerned. Ambitious climate change mitigation options cannot be achieved without giving due consideration to the behaviour of terrestrial carbon. The strategies for mitigation of climate change in agricultural sector need to focus on natural resource conservation in a sustainable manner, agricultural management practises to enhance soil organic matter and carbon sequestration, efficient soil testing programme, amelioration of problematic soils, land cover management, soil erosion control and soil pollution control.

Livestock: Actions in the livestock sector are aimed at lowering climate stress on livestock with a focus on animal/bird nutrition, safe housing, breeding, and health to enhance their productivity. The outcomes of the schemes included are climate-resilient livestock and farm income, lower emission intensity of milk production, and higher farm income supplemented by income from backyard poultry and promotion of circular economy (conversion of poultry waste into animal or fish feed, reduced livestock mortality due to disease and decreased incidence of diseases). Veterinary Services can be made environment friendly through the improvement of the healthcare system in the form of effective monitoring and disease surveillance, strengthening of veterinary poly clinics/ veterinary hospitals/veterinary dispensaries, animal disease control project, intensive mastitis control programme, disease mapping though GIS, systematic upgradation of the breedable dairy stock, artificial insemination facilities, scientific breeding and management practices, supplementing mineral mixture & deworming in milch animals etc.

Fisheries: The warming of the climate system is unequivocal. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished and sea level has risen. Coastal flooding and loss of coastline due to erosion is affecting the marine ecosystems that have been the primary source of livelihood for coastal fishing communities in Kerala. Aquatic systems that sustain fisheries and aquaculture are also undergoing significant changes as a result of global warming and projections indicate that these changes will be accentuated in the future. Nature Based Solutions (NBS) for adaptation need to be prioritized to regenerate coastal resources and prevent further degradation of coastal areas as well as inland water bodies. Projects based on adaptation strategies to address the coastal as well as aquatic vulnerability has been selected which include modernisation of fishing fleet, stock enhancement programmes, conserving the natural ecosystem etc. Climate change affects communities and livelihoods in fisheries sector, and efforts to adapt to and mitigate climate change must also be human centred. For improving the capacity of relief shelters and having appropriate rescue relief and

rehabilitation mechanisms in place in case of adverse climatic conditions, there is a need to provide safe housing to coastal communities. Alternatively, investment is made in providing safe housing facilities, insurance coverage and post-harvest activities which has mitigation co-benefits. For addressing the long-term consequences of plastic waste on the marine ecosystems, a major intervention is made through the project "Suchitwa Sagaram". Actions are targeted at amplifying both coastal and inland aquaculture production to ensure food security and sustainably enhanced income; development of climate resilient coastal villages with safe housing for fishing communities, climate proofing of fisher folk livelihood by diversifying income sources and loss and damage reduction due to coastal hazards; and development of post-harvest infrastructure essential to minimize losses.

Forest and Wildlife: Although the forest coverage across the State is impressive, few districts have relatively lower bio-diverse forest area and coverage, insufficient forest protection, and fewer water bodies in forests. Inadequate field-level human resources and establishments for forest conservation, as well as increasing number of forest fires and human-wildlife conflicts, increase the vulnerability in the sector. Improving the forest biodiversity, controlling invasive species, and managing forest fires and human-wildlife conflict are essential to build adaptive capacity in the sector. The floods of 2018 and 2019 have resulted in extensive loss of vegetative cover, landslides, erosion of humus-rich topsoil and consequent degradation affecting the water retention potential of the forest floor. Measures are required for the eco-restoration of climatically and ecologically vulnerable areas both in forests and connected hilly tracts in the agro-ecosystems. Forests are to be treated as the major source of carbon sink to counteract GHG emissions in other sectors.

Environment: The Directorate of Environment and Climate Change (DoECC) is the nodal agency coordinating the environmental issues in the State with the support of State Biodiversity Board and State Pollution Control Board. The first Kerala State Action Plan on Climate Change was drafted by the Directorate of Environment and Climate Change with inputs from relevant departments,

agencies and research institutions. All schemes in the environment sector directly and indirectly support climate change management and accordingly all of them are selected as part of the Environment Budget. Climate change mitigation and adaptation strategies and action plans are directly monitored by DoECC through the SAPCC and the agencies such as Biodiversity Board and Pollution Control Board complement the environment management and biodiversity conservation.

Water Resources: As the global population and consumption continue to grow, it is important to identify measures to reduce the water footprint in order to protect this vital resource. Climate change is primarily a water crises and the change is dangerously affecting the water supply. The impact of it could be felt in several ways like floods, rising sea levels, droughts and such disaster risks. By rapidly cutting emissions of greenhouse gases, the risks of climate change could be lessened. Protecting and restoring freshwater ecosystems reduces GHG emissions and also acts as a buffer to extreme climatic events. One way to combat the situation is the use of more efficient technologies that use less water. Efficient irrigation management helps in water saving and increased yields. While it is essential for water management to adapt to climate change, water management can also play a very important role in climate change mitigation. Water efficiency measures have a direct effect on energy savings, which can lead to the reduction of greenhouse gas emissions (GHGs). Canal maintenance with better irrigation supply also helps in water, energy and carbon savings. Similarly, water conservation also helps in preventing pollution of water bodies and also to prevent greenhouse gas emissions. Investing in water infrastructure, such as water treatment plants, water distribution networks and water storage facilities can help to improve the quality and availability of water resources and reduce the impact of climate change.

Co-operation: The State has an extensive network of co-operatives engaged in various activities, including agricultural credit, public distribution system, distribution of agricultural commodities, health, education including professional education, housing, agro processing and development of Schedule Caste and

Scheduled Tribe, women's development and fisheries. The concept of nature-positive production revolves around the possible synergies between ecosystem restoration and food/biomass production and among biodiversity, nature and agriculture. Co-operative Initiative in Technology Driven Agriculture (CITA) is the scheme included under the Environment Budget. It has mainly five important operational areas including soil and water conservation; soil improvement; evolutionary populations; integrating crops, forestry, livestock and aquaculture; and integrated pest management. These activities will have positive impact in restoring critical habitats, protecting watersheds and improving soil health.

Soil survey: Soil and water conservation is the backbone of agriculture economy in the State and survey and digitization of scientific data is a prerequisite for natural resources management. Natural resource database developed from satellite data help conservation of ecology and environment. Conservation of soil and water resources is a matter of prime concern of the State for sustainability of agriculture, environment and overall sustenance of biodiversity. The main implementing agencies involved in the soil and water conservation activities in the State are the Department of Soil Survey and Soil Conservation, Kerala State Land Use Board, Kerala State Remote Sensing and Environment Centre and Kerala Land Development Corporation. The schemes and components included as part of Environment Budget are 'Decision support system' and 'Satellite data based report generation' of KSREC. The other components include 'Resource Survey at Panchayat and Block Level' of State Land Use Board.

Energy Sector: Kerala is the first State in the country to attain 100 per cent household electrification. Total installed capacity of power in the State is 2,966 MW, of which, hydel power contributes 71.8 per cent; followed by thermal projects (15.7 per cent), solar (10.13 per cent) and wind (2.37 per cent). To counter global warming the power sector in the State is fully alive to the technological advances that have taken place in the recent two decades in the country and the State's strategy in the sector is drawing on the benefits of this advancement. It is also leveraging on a number of new innovative ideas and initiatives to maintain its

growth in the new era of sustainability. Especially in the era of renewables, newer forms beyond solar and wind need to be considered and evaluated for development and deployment in the State. KSEBL is considering all option to harness renewable power. Besides development of solar power through Soura project, installations of other renewable plants are expedited. Implementing and regulating agencies associated with the non-conventional and renewable sources of energy in Kerala are (i) Agency for Non-conventional Energy and Rural Technology (ANERT) and Energy Management Centre (EMC). ANERT is the nodal agency for the propagation and implementation of program/projects under renewable and potentially renewable energy sources, rural technologies and promoting the idea of Carbon neutral governance for government institutions with renewable energy and electric-mobility. The specific programmes under the various plan schemes by ANERT are envisaged for increasing the use of renewable energy sources in the State and to create an eco-system for renewable energy development. The EMC is tasked with the implementation of various schemes focusing energy saving measures in Govt. departments, establishments, industry, commercial buildings, domestic sector encouraging development of technologies related to energy management through research, training, demonstration programmes and awareness creation. The SAPCC envisages prudent emission reduction targets to avoid higher GHG emissions in the future due to an increase in energy demand. Reducing GHG emissions across the full energy sector requires major transitions, including a substantial reduction in overall fossil fuel use, the deployment of low-emission energy sources, switching to alternative energy carriers, and energy efficiency and conservation.

2.2 Approach and Methodology

The Kerala Environment Budget is an evolving one and will be refined in alignment with the challenges being faced, lessons learned from the experience and through the feedback from experts. As a first step an analysis is done by selecting schemes from environment sensitive areas elaborated above. Only those schemes that have positive impact on the environment are selected as part of the

Environment Budget for 2024-25 such as schemes related to conservation of biodiversity and natural resources, pollution and waste management, or climate change adaptation which intends to reduce the vulnerability of human or natural systems to the current and anticipated impacts of climate change, including climate variability, by maintaining or increasing resilience through an enhanced ability to adapt to or absorb climate change stress, shocks, and variability and/or a reduced exposure to them.

2.3 Consolidated Statements of Sectors Considered

Sectors	*No of schemes selected*	*Budget allotted for environment component (Rs lakh)*	*Remarks*
Agriculture	**8**	**19602.00**	Schemes such as farm plan, soil health, KAU, crop diversification, development of fruits, vegetables, and spices are included.
Soil and Water Conservation	**2**	**642.00**	Schemes including resources survey at Panchayat level and KSREC are included.
Animal Husbandry and Dairy	**7**	**7047.00**	Schemes of insurance programmes, strengthening of veterinary services, breeding facilities and programmes, fodder development and milk-shed development programmes are included.
Fisheries	**12**	**19518.00**	Schemes such as conservation of fisheries resources, sea safety and rescue, insurance schemes, Suchitwa sagaram, PMMSY etc. are included.
Forest and Wildlife	**31**	**16979.00**	Schemes of forest protection, biodiversity conservation, eco-development and eco-tourism, wildlife sanctuaries, national parks, forest fire protection works, Tiger reserves and project elephant, Man-animal conflict management, bio-sphere reserves etc. are included.
Co-operation	**2**	**3100.00**	Schemes including CITA, Assistance to PACS for carbon zero emission are included.
Water Resources Management	**5**	**6654.00**	Schemes such as flood management programmes in Kuttanad, Thottappally project, ground water management, Coastal management, restoring polluted stretches, and flood early warning systems etc. are included.
Energy Management	**2**	**420.00**	Schemes including energy conservation fund and green energy hub are included.
Ecology and Environment	**12**	**2532.00**	All 12 schemes from the sector are included.
Total	***81***	***76494.00***	***Outlay of Rs 765 crore in 81 schemes under 9 sectors***

CHAPTER III
CLIMATE CHANGE IMPACT ON KERALA ECONOMY

The extreme climate change events are projected to increase, indicating changes in the magnitude, frequency, and timing of occurrence, which will have implications on natural resource sectors such as coastal fisheries, forests, water, etc., and socio-economic systems such as agriculture and health, and communities. Alternative development paths influence risk by changing the likelihood of climatic events and trends, through their effects on GHGs and land use, and by altering vulnerability and exposure. The emerging changes in temperature and rainfall, their variability, and the observable increase in the frequency of occurrence of disastrous extreme events have impact on both natural ecosystems and socio-economic systems, in particular, in Coastal and low land areas. Such impacts are projected to exacerbate under future climate change, placing these systems at high risk.

Climate change and variability have an impact on the natural resources that provides us with food, clean water, pure air, healthcare, and recreational opportunities. Food services are reliant on agricultural and livestock farming, both of which are vulnerable to climate change. Climate change has an impact on a variety of parameters related to livestock productivity, reproduction, health, and adaptability, and also affects the parameters that govern agricultural productivity. Kerala, being a coastal State, is at risk of sea level rise and its coastline is susceptible to large-scale sea erosion, losing over 40per cent of its coastline to the sea over the past quarter century, leading to more frequent and severe coastal flooding in low-lying areas and coastal erosion. According to the IPCC's Sixth Assessment Report global warming is projected to intensify the global water cycle, including its variability, global monsoon precipitation, and the intensity of wet and dry episodes, which can have implications for the water sector. These, in

combination with anthropogenic influences, are already wreaking havoc on livelihoods and food security.

Climate change can affect human health directly and indirectly through changes in the ranges of disease vectors (e.g., mosquitoes), water-borne pathogens, water quality, air quality, and food availability and quality. Kerala was one of the first Indian States to establish tourism as a separate business and climate change has already impacted the tourism industry in Kerala. It is expected to have far-reaching consequences in the coming years, affecting the consumer's vacation choices with respect to geographical locations, the destination's competitiveness and sustainability, and tourism's contribution to State's development. It is imperative to develop sustainable, economic and local-level nature-based adaptation solutions and to protect the State from further loss and damages due to extreme events and other climate change impacts.

Agriculture: Due to temperature rise and changes in water availability, Kerala's agriculture sector is vulnerable to climate change, which can have severe effects on crop yields across agro-ecological zones. Rice is one of Kerala's most significant crops, and the effects of climate change on rice have been extensively investigated. Studies show that increase in temperature considerably affected the grain output of rice and future rice yields will fall due to increase in temperature and variation in rainfall. Climate change will have an impact on the spices and is the primary determinant for spice production. Cardamom is a significant spice grown in Kerala. As cardamom is particularly sensitive to both excess rainfall and drought, rainfall, an essential climatic variable related to climate change, has a huge impact on cardamom yield. Temperature is a crucial predictor of nut yield in coconut, which is one of Kerala's most important tropical crops. Changes in rainfall patterns have had a negative impact on coconut production. Considering all these factors and the high percentage of area exposed to hazards, the risk to agriculture and its productivity in the State is very high. Plantation crops being perennial in nature deplete nutrients from limited volume of soil for a long time and these crops constitute 28 per cent of the total cropped area in the State. Climate change will

have greater impact on the production and productivity in the plantation sector and also in the farm export sector.

Food Security: Ensuring food security in the context of changing climate and growing population is a major challenge. Achieving food and nutrition security on a sustainable basis depend on sustainable agriculture while minimizing environmental impacts. Rising temperatures and more unpredictable rainfall, and the loss of agricultural area owing to droughts and flash floods, are predicted to lower crop production. This is likely to put the food security in jeopardy.

Livestock: Climate change has an impact on a variety of parameters related to livestock productivity, reproduction, health, and adaptability. Studies show that higher temperatures cause changes in the animal's body physiology, such as increased respiration rates, blood flow, and body temperature. Higher-milk-producing breeds are more susceptible to heat stress as it leads to increased metabolic heat generation, whereas low-milk producing animals are more resistant. The dry matter intake and milk yield are reduced as the temperature and temperature humidity index value rise above the crucial threshold level. Studies show that high ambient temperature causes 35per cent reduction in milk yield in mid lactating cows and 14 per cent reduction in early lactating dairy cows. Exposure of lactating ewes under high ambient temperature decreases milk yield to 20 per cent. Heat stress adversely affects poultry farming also. Heat stress reduces chicken feed intake, resulting in poorer body weight, egg production, and meat quality, as well as reduced eggshell thickness and increased egg breakage. Livestock is vulnerable to most of the extreme events, but the most calamitous is flood. When animals stand in contaminated water for an extended period of time, diseases of the hooves and skin may develop. They are vulnerable to tetanus and other poisons in the flood water due to deep incisions in their skin. Furthermore, animals become susceptible to hepatitis, diarrhoea, food poisoning, and other diseases. The 2018 Kerala floods resulted in the death of 5163 cows, 541 buffaloes, 5166 calves, 1228 heifers, 6380 sheep/ goats, 1053 pigs, 20000 quails, 1143734 poultry and 464772 ducks, leading to the loss of Rs 167.8 crore.

Fisheries: Climate change has already led to a notable sea level rise globally and is projected to continue in the future. The NASA Sea Level Projection Tool that uses data from IPCC 2021 shows that Kochi might possibly experience a sea level rise of 0.22m by 2050, and a 0.58m by 2100. The coastal districts of Kerala are spread over 59per cent of the State's area and are very densely populated. The National Shoreline Change Assessment carried out by the National Centre for Coastal Research (NCCR) for a period of 26 years (1990–2016) shows that 45 per cent of the Kerala coast is eroding, 34per cent is stable and 21 per cent is accreting. Coastal flooding and loss of coastline due to erosion is making the government relocate many of the coastal population to other places. Marine ecosystems are traditionally the primary source of livelihood for coastal fishing communities in Kerala. In recent years, rising sea level and sea surface temperatures have adversely affected such ecosystems and the income fishing communities derive from them. Changes in temperature, dissolved oxygen, and acidity associated with climate change, impact plankton productivity, with cascading effects up the food chain. In addition, the loss of coral reefs and their diminishing role in the marine ecosystem, and threats to fishery productivity and marine biodiversity are major challenges. Decline and changes to marine productivity threaten both livelihoods and subsistence on Kerala's extensive coastline. Modelling of the FAO suggests declines in marine productivity between 10per cent and 17per cent by 2050. It is estimated that the fisheries sector supports around 10.44 lakh fisher folk population in Kerala, of which 1.95 lakh are active coastal fishers. Climate change can have both direct and indirect impacts on aquaculture. The short-term impacts include loss of production and infrastructure arising from extreme events such as floods, increased risk of diseases, parasites and reduced production because of negative impacts on farming conditions. Long-term impacts include reduced availability of seed as well as reduced precipitation leading to increasing competition for freshwater and increase in sea level. Small-scale fishers and small-scale aquaculture are particularly vulnerable to climate change; and is a result of both locational as well as their poverty situation. Some marine ecosystems, such as mangroves, salt marshes, and seaweed ecosystems, beyond having high

biodiversity values and providing breeding grounds and nurseries for fisheries, can also play a key role in mitigating global climate change through their ability to store carbon. These blue carbon ecosystems are being degraded at a very high rate in the State.

Forests and Biodiversity: Globally, forests are prone to various stresses, including changes in the hydrological cycle, loss of biodiversity, warming climate, forest conversion, etc. Forests support the livelihoods of millions of individuals, and this dependence on forests becomes extremely acute and visible in the event of a drought, flood, crop failure, or other such calamities. Climate change is now determined as being inevitable and is projected to increase the physiological stress on forests due to higher temperatures, longer drought duration, and modified frequency of occurrence of extreme events. This has severe repercussions for the conservation of biodiversity and ecosystems, especially in tropical forests. The IPCC report warn that climate change has already impacted the environmental and ecological systems. Projections show that extinction risks will increase and the greater the climate change, the higher will be the associated risk. The forest ecosystems are susceptible to stress due to the high dependence of local communities on forest resources as also due to increasing incidents of climate extremes and climate variability—such as frequent droughts, high levels of warming, water stress, El Nino phenomenon, etc. The projected changes in mean climate and climate extremes could also contribute to further forest vulnerabilities. The recorded area of the forest in the State is 11,524.2 sq km or about 29.65 per cent of the State's geographical area (38,863 Sq. km). However, the actual forest area including those outside the reserved forests is much more. According to FSI, total Carbon stock of forest in the State (including trees outside forest with a size of more than 1ha) is estimated to be 205.5 million tonnes (753.57 million tonnes of Carbon dioxide equivalent), which is 2.8 per cent of total forest carbon of the country.

Energy Sector: The power generation, transport, industries, agriculture (energy use), and buildings, which account for 80per cent of the emissions from the State,

had grown significantly over the last two decades. In the energy sector, transport (54per cent) was the highest contributor to GHG emissions, followed by the building sector (21per cent). The state is currently in an energy transition mode with electrical energy adoption accelerating in the mobility sector. Electricity generation from wind, solar photovoltaic, small and medium hydro projects should be tapped to its full potential. The Kerala State Electricity Board Ltd. (KSEBL) is a single holding company with generation, transmission and distribution of electricity in the State. The agency is considering all options to harness renewable power.

Health Issues: Floods increases the rate and spread of waterborne diseases such as diarrhoea, cholera, hepatitis E, leptospirosis, and other gastrointestinal infections, posing serious public health implications. It also increases the risk of vector borne diseases, such as malaria and dengue fever; and respiratory and allergic diseases, such as asthma and skin rashes. Stagnant water and increased precipitation produce breeding grounds for mosquitoes, bacteria, viruses, and other microorganisms like mould, which increase susceptibility to infectious diseases or pandemic outbreaks and lead to higher levels of morbidity and mortality. These health concerns are linked to mental health issues, including sadness, stress, and anxiety, all of which aggravate physical problems. The subsequent health effects, when combined with their economic consequences, large-scale relocation, and infrastructure disruption, can result in a significant deterioration in the impacted population's overall quality of life.

Tourism: Climate change can cause severe impacts on the tourism industry, depending upon the geographical location and type of activity. Extreme weather events as fallout can influence tourist activity as well as their safety. Beaches are some of the most popular tourist locations in Kerala, considering it is a coastal state. Lagoons, mangrove swamps, sandy and rocky coasts, and open seafront make up Kerala's tropical marine ecosystem. As a result, coastal areas are tourist attractions and significant economic contributors. Coastal areas are under threat from climate change as sea level rise is altering shorelines and coastal boundaries,

resulting in seawater intrusion. This results in migration of local population to other areas, which will have an impact on economic growth. Furthermore, the loss of coastal areas and shorelines has the potential to damage the habitats of many ecologically sensitive species, resulting in biodiversity extinction. Ecotourism, particularly in relation to national parks, has proven to be a popular tourist attraction. The appeal of forests as recreational destinations (hiking and trekking) has grown in recent years. The increasing risk of species extinction, decreasing freshwater, expanding health and life insecurity, increasing accidents due to wildfires, increasing heat waves, and rising disease risks are all potential hazards to Kerala's eco-tourism.

Conclusion

The Kerala Environment Budget is in primary stage which requires further investigation and feedback to be evolved as a robust one. It is a reflection of State's commitment for mainstreaming the environmental awareness and assess the effectiveness of government spending. Due to this exercise, a systematic approach can be evolved in planning and designing schemes, fruitful budgetary allocation and proper implementation. In state plan we have more than thousand plan schemes out of this we have taken only 81 schemes under 9 sectors for the calculation of environment component as an initial step. In coming years efforts for including entire plan schemes and some non plan schemes in the purview of Environment Budgeting will be taken. Revamping/ reorientation if any needed can also be identified.

ENVIRONMENT BUDGET STATEMENTS

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25						
1.1 AGRICULTURE (Rs in lakh)						
Sl. No.	**Scheme code**	**Name of Scheme**	**Major Head**	**Budget Outlay**	**Outlay proposed for Emvironment**	**Details of the Environment components/Activities**
1	AGR 001	Kerala Agricultural University	2415-01-277-99 (P)	7500	4200	Research programmes giving thrust to crop improvement through new breeding techniques for development of climate resilient , pest and disease resistant, biotic and abiotic stress resistant varieties, development of bioformulations and microbes for plant protection, Development of integrated farming system models -
2	AGR114	Rice development	2401-00-102-90 (P)	9360	5500	Assistance for sustainable rice development and royalty for conserving paddy lands.
3	AGR114	Vegetable development	2401-00-119-85 (P)	7845	20	Conducting pesticide residue analysis in vegetables.
4	AGR 005	Coconut development	2401-00-103-87(P)	6500	6500	Integrated management & judicious use of resources.Popularisation of improved varieties, improving efficiency of plantation
5	AGR 124	Development of Spices	2401-00-108-59 (P)	460	460	Area expansion of spices including intercropping . Promotion of improved management practises.
6	AGR 193	Development of fruits, flowers & medicinal plants	2401-00-119-79 (P)	1892	1867	Area expansion of fruit and flowers.
7	AGR 127	Soil and Root Health Management & Productivity Improvement	2401-00-800-28 (P)	550	550	Improving soil health and increasing productivity through soil test based nutrient applications and integrated nutrient management practises.Balanced nutrient application and site specific management practises.
8	AGR051	Organic Farming and Good Agricultural Practices	2401-00-105-85 (P)	600	505	Promote safe to eat food production through organic practices and good agricultural practises.Low external input usage.
Total				**34707**	**19602**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

1.2 SOIL AND WATER CONSERVATION (Rs in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
1	SWC 004	Resource Survey at Panchayat and Block level	2402-00-001-96 (P)	243	243	The scheme includes (1) Preparation of NRM Plan for micro watersheds (2) Land Use assessment, management,and conservation plans for geologic, geo-heritage and heritage sites of Thiruvananthapuram district (3) Preparation of Land Use Plan at LSGI level.The above programs have positive impact on environment.
2	SWC 003	Kerala State Remote Sensing and Environment Centre	2402-00-001-94 (P)	830	399	1." Satellite data based report generation of plots related to Wetland and Paddy Conservation Act"-to assess the land use status as on August 2008 especially whether paddy and wetland converted to a plantation crop. 2."Decision support system for spatial planning and empowering Local self-governments in spatial governance" helps to develop comprehensive spatial data base of natural resources which helps conservation of ecology and environment.
Total				**1073**	**642**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

1.3. ANIMAL HUSBANDRY (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
1	AHY 004	Strengthening of Veterinary Services	2403-00-101-97	2718.00	140.00	**Components/Activities:** **1) Conduct of camps, vaccinations and squads**: Direct Support: Immediate Relief, Preventive measures Addressing Environment and climate change: Building resilience, Reducing environment and climate change, considering the direct support in times of need, the focus on preventative measures, and the contribution to environmental and climate change resilience, it is reasonable to connect the "Conduct of camps, vaccinations and squads in animal husbandry sector" scheme to natural disasters and the environment. **2) Disease mapping through GIS:** Precise farm/animal data allows faster outbreak identification and targeted action, crucial for climate-sensitive diseases. Risk Mapping, Tracking and analysis, early warning system, promotes resilient husbandry.
			4403-00-101-99	500.00		
2	AHY 021	Modernisation and e-Governance	2403-00-113-93	250.00	250.00	"Modernisation and E-Governance" in Animal Husbandry holds significant potential to contribute to a more sustainable and climate-friendly sector. By addressing the challenges and focusing on data-driven decision making, promoting sustainable practices, and ensuring equitable access, E-governance can play a crucial role in mitigating the environmental impact of animal agriculture and adapting to the challenges of climate change.

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
3	AHY 024	Expansion of Cross Breeding Facilities	2403-00-102-96	700.00	655.00	Components/Activities: Purchase of equipments, cost of seman and deworming and mineral mixture supplement programme. By implementing the scheme, the productivity of cattle will be enhanced Increasing animal productivity can potentially decrease the carbon footprint of animal agriculture Supply of mineral mixture and dewormers,Infertility Management Programmes. By achieving shorter calving intervals, the program aims to increase milk production without necessarily increasing the total cattle population. This can lead to: •Lower land-use change: Less deforestation and habitat conversion for grazing and feed production. •Decreased methane emissions: Fewer cattle releasing enteric methane, a potent greenhouse gas. Improved efficiency: •Early calving and shorter calving intervals lead to: •Faster generation turnover: Quicker replacement of older, less efficient animals with younger, more productive ones. •Enhanced feed conversion: More milk produced per unit of feed consumed, minimizing resource use and emissions associated with feed production.
			4403-00-102-99	20.00		
4	AHY 051	Special Livestock Breeding Programme	2403-00-102-78	4200.00	4250.00	Introduction of scientifically reared calves with better production efficiency, for increasing the milk production and also to decrease the age at maturity and for reducing inter calving period.The Gosamrudhi scheme presents an opportunity to indirectly contribute to environmental and climate change mitigation by promoting herd resilience, encouraging sustainable practices, and informing risk assessment and adaptation strategies. However, its effectiveness hinges on responsible implementation, ensuring equitable access, and addressing potential drawbacks for a truly positive environmental impact.
			2403-00-102-79	50.00		

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
5	AHY 065	Comprehensive Livestock Insurance Programme (GOSAMRUDHI)	2403-00-108-97	500.00	500.00	The scheme aims towards management of risk and uncertainities by providing a protection mechanism to the farmers against any eventual loss of their animals due to death or permanent total disability resulting in total loss of production or infertility through insurance coverage.
Total				**8938.00**	**5795.00**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

1.4. DAIRY DEVELOPMENT (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
1	DDT 035	Production and conservation of fodder in farmers fields and Dairy Co-operatives	2404-00-102-77	850.00	850.00	**Assistance for cultivation of Hybrid Napier in farm land-20 cents and above:** The Scheme envisages assisting cultivation of perennial fodder in a total area of 2150 Ha of land providing planting material free of cost and assistance for cultivation to farmers. **Assistance for comprehensive and massive fodder cultivation in barren and unutilised lands:**Through sustainable land use, biodiversity promotion, and efficient resource management, this initiative signifies a step towards climate-resilient agricultural practices. By promoting agroforestry and enhancing soil health, the scheme contributes to carbon sequestration and reduced greenhouse gas emissions, thus playing a role in mitigating climate change impacts.
2	DDT 012	Commercial Dairy and Milkshed Development Programme	2404-00- 109 - 93	3380.00	150.00	**Elevated and community cattle shed:** assistance for construction of scientific cattle shed.It will ensure continuity in dairy operations during annual floods, preventing livestock casualities and providing a secure environment for the surviving animals. **Assistance for construction of scientific cattle shed:**focusing on agricultural practices for disease prevention and ensuring food safety. Scientific designed cattle sheds helps to keep the animal in optimum THI (temperature-Humidity Index) thus reducing the environmental heat stress and maximize the productivity and thereby ensuring profitability to farmers
			4404-00-109-96(01),(02),(03),(04)	500.00	252.00	
Total				**4730.00**	**1252.00**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

1.5 FISHERIES (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
1	FSH 128	Conservation and Management of fish resources (Marine)	2405-00-103-91	900	900	To sustain marine fisheries for nutritional food security, economic growth and ensuring the sole livelihood of fishermen, effective surveillance and management principles in natural marine fisheries have to be effectively implemented. The components include implementation of KMFR Act, online registration and licensing of fishing vessels, co-management of marine fishery resources & functioning of Fisheries Management Councils (FMCs) etc
2	FSH 180	Aquaculture Development	2405-00-101-54	6750	6750	Promotion of different aquaculture systems like cages, bioflocs, seaweed and mussel-oyster farming, aquaponics, riverine and open water systems.It also proposes utilizing the potential resources available in the State for shrimp farming
3	FSH 195	Sea safety and sea rescue operations	2405-00-103-76	250	250	Tracking fishing boats by utilizing low-cost advanced airborne sensors (AAS) to aid rescue missions during extreme events and ensure the availability of safety equipment.
4	FSH 209	Reservoir Fisheries Development	2405-00-101-51	100	100	To enhance inland fish production through reservoir fisheries.
5	FSH 213	Cleaning of Vembanad Lake	2405-00-101-50	100	100	The scheme envisages protecting and conserving the natural ecosystem of brackish water lakes of Kerala

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
6	FSH 239	Modernization/Upgradation of Fishing Fleet (Traditional/Mechanised)	2405-00-110-94	100	100	It is proposed to replace the traditional fishing craft especially plywood craft with modern FRP vessels for more strength, safety efficiency and facilities
7	SAD 034	Basic Infrastructural facilities and Human development of Fisher folk (Revenue head)	2405-00-103-80	4000	4000	Improve participation of SHGs run by fisherwomen in livelihood development programmes.Enhancing the income generation capacity of the sector.Awareness programmes relating to mitigation and adaptation.
8	SAD 034	Basic Infrastructural facilities and Human development of Fisher folk (Capital Head)	4405-00-103-93	2000	2000	Envisages a sustainable coastal village including provision for the improvement of basic amenities such as safe drinking water, sanitation, provision for health facilities, houses, setting up of fish marketing centres, construction of fisheries schools,
9	SAD 034	Basic Infrastructural facilities and Human development of Fisher folk(Punargeham)	4405-00-103-89	4000	4000	It proposes the rehabilitation of all families residing within 50m from HTL under the constant threat of sea erosion to safer locations. The evacuated land within 50 metres from the sea coast can be used for the formation of bio-shield
10	SAD 044	Group insurance scheme for fishermen	2405 -00-121-92	1000	1000	Ensuring the safety of the fish workers.

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
11	SAD 045	Group Insurance scheme for allied workers	2405-00-121-96	118	118	Ensuring the safety of the allied fish workers
12	FSH 211	Removal of Plastic from water bodies-"Suchitwa Sagaram"	2405-00-103-69	200	200	The scheme is proposed to reduce plastic waste accumulation in the sea and conservation of aquatic life from the plastic menace
Total				**19518**	**19518**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

1.6 FOREST AND WILDLIFE (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
1	FOR 002	Forest protection	2406-01-101-81	2500.00	2500.00	Survey and forest boundary demarcating structures, improvement of eco-system services, livelihood of forest dependent communities, forest protection activities, measures to reduce forest fire incidents and human-wildlife conflict, staff quarters and procurement of equipments and vehicles for protection, digitization.
			4406-01-101-99 (01)	2500.00	2500.00	
2	FOR 003	Regeneration of denuded forests	2406-01-101-94	225.00	225.00	Raising and maintenance of plantation, fire protection measures, and eco-restoration activities.
3	FOR 073	NWFP including promotion of medicinal plants	2406-01-101-80	160.00	160.00	Fencing, awareness programmes, medicinal plantation, fire protection, documentation and mapping, biodiversity conservation
4	FOR 004	Hardwood Species	4406-01-105-87(01)	500.00	500.00	Raising of plantations and nursery, maintenance of plantations
5	FOR 005	Industrial Raw material	4406-01-105-87 (02)	50.00	50.00	Replanting, maintenance, eco-restoration, indegenous species
6	FOR 143	Minimum Support Price for Minor Forest Produce (25%SS)	2406-01-105-89	100.00	100.00	Procurement of wild honey, collection centres of FDA, Centralised collection, value addition, processing.
7	FOR 011	Conservation of Bio diversity	2406-02-110-68	597.00	597.00	Habitat improvement, awareness creation, natural resources management, rescue centres, fire protection, camps, eco-development activities, observation of wildlife week, capacity building, research, removal of weeds, roads/paths, captive elephant management, surveys and monitoring

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
8	FOR 015	Eco development Programme	2406-02-110-56	350.00	350.00	Participatory conservation of natural resources, resources management, alternative livelihoods, hamlet development, fire protection, facilities and eneregy management, Camps, EDC.
9	FOR 016	Eco-Tourism	4406-01-800-91	600.00	600.00	Reovation, strengthening and consolidation of sites, procurement of materials and equipments, maintennace of facilities, protection acitvities, waste management
10	FOR 069	Elephant care centre at Kappukad near Kottoor	2406-02-110-29	200.00	200.00	Enhancement of facilities in the centre
11	FOR 107 to 122	Management of Wildlife Sanctuaries (16 nos) (40% SS)	2406-02-110-(13 to 28)	300.00	300.00	Protection of wildlife habitats, mitigation of human-wildlife conflict, eco-development, awareness creation, capacity building, eco-tourism
12	FOR 123 to 127	Management of National Parks - 5 Nos (40% SS)	2406-02-110-(75 to 79)	120.00	120.00	Protection of wildlife habitats, mitigation of human-wildlife conflict, eco-development, awareness creation, capacity building, eco-tourism
13	FOR 128	Management of Community Reserve (40% SS)	2406-02-110-72 (02)	12.00	12.00	Protection of wildlife habitats, mitigation of human-wildlife conflict, eco-development, awareness creation, capacity building, eco-tourism, infrastructure facilities, capacity building, camps
14	FOR 129 to 130	Project Tiger - 2 Reserves (40% SS)	2406-02-110-(73 to 74)	600.00	600.00	Protection of wildlife habitats, mitigation of human-wildlife conflict, eco-development, awareness creation, capacity building, eco-tourism, infrastructure facilities, capacity building, camps, anti-poaching acitvities
15	FOR 131	National Afforestation Programme -National Mission for Green India (40% SS)	2406-01-102-86 (02)	200.00	200.00	Eco-system services, enhancement of tree cover outside forest, agro-forestry and social forestry, restoration of wetlands, alternative energy

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
16	FOR 132	Integrated Development of Wildlife Habitats (Protection of Wildlife outside protected areas)	2406-02-110-52 (02)	300.00	300.00	Elephant proof walls and trenches, RRTs, squads, wildlife monitoring, relief of victims, study and assessment, monitoring systems
17	FOR 134	Forest Fire Prevention and Management Scheme (40% SS)	2406-01-101-77 (02)	240.00	240.00	Forest fire prevention measures, infrastructure support, awareness creation, capacity building
18	FOR 138	Integrated development of Wildlife Habitat to Wayanad Wildlife sanctuary for voluntary relocation of settlements from protected areas (40% SS)	2406-02- 110-31 (02)	200.00	200.00	Relocation of tribal communities
19	FOR 140	Recovery Programme (60%CSS) - (1) Nilagiri Tahr	2406-02-110-12 (02)	26.00	26.00	Habitat management, protection of Nilgiri Tahr, awareness creation
20	FOR 141	Recovery Programme (60%CSS) - (2) Recovery programme for critically endangered species	2406-02-110-11 (02)	22.00	22.00	Habitat management, protection of vultures, awareness creation, documentaries

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
21	FOR 051	Forest Management Information System and GIS	2406-01-800-57	150.00	150.00	IT Supports and devices/softwares/ equipments/machines, website, electronic equipment, monitoring and evaluation
22	FOR 064	Measures to reduce man - animal conflict	2406-02-110-09	4885.00	4885.00	Various measures to mitigate human-wildlife conflict, compensation to victims, insurance, wildlife rescue, relocation of habitats, monitoring and evaluation, RRTs, early warning systems, awareness creation
23	FOR 067	Zoological Park,Wildlife protection and research centre Puthur, Thrissur	2406-02-110- 48	600.00	600.00	Construction and maintenance of infrastructure facilities, establishment expenses
24	FOR 070	Extension Forestry	2406-01-101-78(01)	600.00	600.00	Seedlings production and distribution, urban forests, Vidyavanam, Nakshathra vanam, forestry clubs, Sanjeevani vanam, medicinal gardens, extension activities, obesrvation of important environment days, awareness creation, Forestry Information Bureau.
25	FOR 076	Resource Planning and Research	2406-01-004-92	100.00	100.00	Fire prevention, plantation, silvi-cultural operations, infrastructural facilities, data collection and analysis, working plans
26	FOR 133	Project Elephant (40% SS)	2406-02-110-35 (02)	350.00	350.00	Protection and improvement of elephant habitats, captive elephant management, mitigation of human-elephant conflicts, anti-poaching activities, fire protection, eco-restoration, compensation to victims, translocation of elephants, awareness creation, elephant day celebrations, infrastructure managment
27	FOR 135	Nilgiri Biosphere Reserve (40% SS)	2406-02-110-34 (02)	180.00	180.00	Habitat improvement, threated species rehabilitation, NTFP processing, upliftment of local communities, corridors management, research and monitoring

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
28	FOR 097	Agasthyamala Biosphere Reserve (40% SS)	2406-02-110-33	120.00	120.00	Habitat improvement, threatened species rehabilitation, NTFP processing, upliftment of local communities, corridors management, research and monitoring
29	FOR 142	National Coastal Mission (Conservation and maangement of mangroves in Vembanad and Kannur)-40% SS	2406-02-110-10 (02)	61.00	61.00	Conservaion and management of mangroves, eco-restoration and afforestation, awareness creation, propagation of seedlings
30	FOR 144	Eco-restoration	2406-01-101-76	31.00	31.00	Replating and enrichment with native species, forest fire protection, elimination of alien species, protection of river banks and coastal areas and other eco-systems
31	FOR 134	Forest Fire Prevention and Management Scheme - TSP (40% SS)	2406-01-796-98	100.00	100.00	Fire management with community support through forest management approaches, awareness campaigns, fire watchers
Total				**16979.00**	**16979.00**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

3.1 CO-OPERATION (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Environment	Details of the Environment components/Activities
1	COP 086	Co-operative Initiative in Technology Driven Agriculture (CITA)	2425-00-107-59	1440.00	1440.00	In CITA, agriculture practices are sustainably managed with the help of technology thus giving positive impacts like restoring critical habitats, helps to protect watersheds, and improve soil health and water purity
			4425-00-107-79	1260.00	1260.00	
			6425-00-107-68	300.00	300.00	
Total CITA				**3000.00**	**3000.00**	
2	COP 003	Assistance to Primary Agricultural Credit Co-operatives - Net Zero Emission	2425-00-107-66	450.00	100.00	Starting of electric charging stations, bio-gas plants, setting up of solar panels on their own buildings, carbon neutral certified products and carbon auditing.
			2425-00-107-80	875.00		
			4425-00-107-89	125.00		
			6425-00-107-72	50.00		
Total				**1500.00**	**100.00**	
Grand Total				**4500.00**	**3100.00**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

4. IRRIGATION & FLOOD CONTROL (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Environment	Details of the Environment components/Activities
1	MIN 062	Restoring polluted stretches of rivers based on National Green Tribunal order	2702-01-800-86	200.00	200.00	The objective of the scheme is to restore the polluted river stretches based on the orders of National Green Tribunal
2	MMI 098	Establishing Flood Early Warning System	4701-80-800-69	100.00	100.00	This system helps in issuing timely warnings to facilitate disaster preparedness
3	MMI 101	Thottappally Project	4701-21-800-96	500.00	500.00	Protection works on the banks of Pamba river to safeguard the region from flooding
4	FC 032	Flood Management Programmes in Kuttanad	4711-01-103-84 (01),(02),(03)	5700.00	5700.00	Various flood mitigation works to protect the padasekharamas from flooding
5	FC 012	Coastal Zone Management	4711-02-103-99	154.00	154.00	For protecting the coastal stretches from the wave attack, it is envisaged to construct seawall using modern technologies
Total				**6654.00**	**6654.00**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25						
5 ENERGY (Rs. in lakh)						
Sl. No.	**Code No.**	**Name of the Scheme**	**Head of Account**	**Budget Outlay**	**Outlay proposed for Environment**	**Details of the Environment components/Activities**
1	NRE 004	(5) Kerala State Energy Conservation Fund	2810-00-104-98 (05)	460.00	340.00	(i) Promotion of energy efficiency projects and energy management systems including implementation of Angan Jyothi project (in Anganawadis) and Urjayan project (ii) Development and demonstration of clean energy technologies
2	NRE 001	(9) Green Energy Hub	2810-00-800-78	80.00	80.00	To achieve the target Net Carbon Neutrality by 2050 and 100 per cent Renewable Energy based State by 2040.Outlay provided to take the leadership position intending to lead on project development and show the path forward on green hydrogen commercialization in the State
Total				**540.00**	**420.00**	

Scheme- wise Estimation of Environment Outlay in the State Budget 2024-25

8.2 ECOLOGY AND ENVIRONMENT (Rs. in lakh)

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
1	EAE 001	Strengthening of the Department of Environment	3435-60-800-99	50.00	50.00	Infrastructure development, Capacity building, Consultancy reports, procurement of instruments/software/geo-spatial data for environment monitoring.
2	EAE 002	Environmental awareness and Education	3435-03-003-98	120.00	120.00	Bhoomithra Sena clubs, Paristhithikam, observance of environmentally significant days, Paristhithimithram awards, other sensitization programmes
3	EAE 003	Environment Research and Development	3435-03-103-99	200.00	200.00	Paristhithiposhini and Vidhyaposhini fellowships, recurring funds for ongoing projects, geo-spatial laboratoy facility, new projects
4	EAE 004	Biodiversity Conservation	3435-03-101-99	1050.00	1050.00	Biodiversity conservation, Access and benefit sharing, research and knowledge hub, strengthening of the biodiversity Board
5	EAE 009	Environment Impact Assessment	3435-04-104-99	160.00	160.00	Capacity buidling, Statutory functioning and operational costs, functioning of district level machinery
6	EAE 016	Climate change	3435-04-104-98	192.00	192.00	State Climate Change Cell, New and recurring projects, Ujjwal Post-doctoral fellwoship
7	EAE 022	Kerala State Pollution Control Board	3435-04-188-99	300.00	300.00	Infrastructure development, procurement of instruments for environment monitoring, digitization, awareness creation, surveillance programmes

Sl. No.	Code No.	Name of the Scheme	Head of Account	Budget Outlay	Outlay proposed for Emvironment	Details of the Environment components/Activities
8	EAE031	State Wetland Authority, Kerala (SWAK)	3435-03-101-89	150.00	150.00	Adminstrative expenses, rejuvenation of Monroe thuruth, implementation of wetland rules, education and data augmentation, integrated management action plans of wetlands
9	EAE033	Kerala Coastal Zone Management Authority(KCZMA)	3435-03-102-87	120.00	120.00	Operational and administrative expenses, expenses of court cases, transportation expenses, website updation, awareness creation.
10	EAE035	State Wetland Authority, Kerala (SWAK) (40% SS)	3435-03-101-87	60.00	60.00	Preparation and implementation of projects based on management action plan for Vembanad, Ashtamudi, Sasthamkotta and other wetlands.
11	EAE 036	Climate resilient farming	3435-03-103-97	30.00	30.00	Development of climate resilient protocol for important agriculture crops, climate change vulnerability and risk assessment of agro-ecological zones of Kerala.
12	EAE 042	Kerala State Climate Change Adaptation Mission	3435-03-103-94	100.00	100.00	Climate change conference, climate change dialogue series, establishment expenses.
Total				**2532.00**	**2532.00**	