

FIRST BIENNIAL TRANSPARENCY REPORT

Sri Lanka 2024

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

First Biennial Transparency Report of Sri Lanka

Submission to the UNFCCC Secretariat

by

Ministry of Environment

Sri Lanka

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National Cleaner Production Center

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FOREWORD

It is with great pride and responsibility of Sri Lanka to present the first Biennial Transparency Report (BTR1) of Sri Lanka to the United Nations Framework Convention on Climate Change (UNFCCC). This report marks a significant milestone in our nation's journey toward addressing the urgent global challenge of climate change with transparency, accountability and commitment.

As a developing island nation, Sri Lanka remains highly vulnerable to the adverse impacts of climate change, including rising sea levels, extreme weather events, and threats to biodiversity and its natural ecosystems. In response, we have undertaken robust measures to mitigate greenhouse gas emissions and adapt to the evolving climate challenges while prioritizing sustainable development and the well-being of our people.

This report highlights Sri Lanka's progress in implementing its Nationally Determined Contributions (NDCs) under the Paris Agreement and provides a comprehensive overview of the country's greenhouse gas inventory, mitigation efforts and adaptation actions. It demonstrates our dedication to meeting international obligations, strengthening domestic policies, and fostering collaborations with global, regional, and national stakeholders.

The preparation of this BTR reflects the collective effort of numerous stakeholders, including public sector agencies, academic institutions, civil society organizations, and the cooperate sector. It has been developed under the guidance of the National Focal Point to the UNFCCC, with the technical support of the United Nations Development Programme and with the financial support of the Global Environment Facility.

We hope this report not only serves as a testament to Sri Lanka's commitment to climate action but also as a resource that inspires continuous improvement and innovation in our collective efforts to combat climate change. As we navigate these challenges, transparency and trust remain essential pillars in our journey to achieving a sustainable and resilient future for all.

On behalf of the Government of Sri Lanka, I extend my sincere appreciation to everyone who contributed to this vital report. Especially, the officials of climate change related Ministries, Departments, Institutions of the government of Sri Lanka, the cooperate sector, non-governmental organizations and the civil society organizations, academia, sector experts and development partners.

Together with all the contributors, we can ensure that Sri Lanka continues to play its part in the global effort to safeguard our planet for future generations.

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Abbreviations

AER	Argo Ecological Regions
AFOLU	Agriculture, Forestry and Other Land Use
BAU	Business As Usual
BDS	Biodiversity Secretariat
BOI	Board of Investment of Sri Lanka
BTR	Biennial Transparency Report
BTR1	First Biennial Transparency Report
BTR2	Second Biennial Transparency Report
CARP	SL Council for Agricultural Research Policy
CBIT	Capacity Building Initiative for Transparency
CBOs	Community Based Organizations
CC&CRMD	Coast Conservation and Coastal Resources Management Department
CCF	Central Cultural Fund
CCS	Climate Change Secretariat
CH ₄	Methane
CIAs	Chambers and Industry Associations
CMC	Colombo Municipal Council
CO ₂	Carbon dioxide
CO ₂ -eq	Carbon dioxide equivalent
CPC	Ceylon Petroleum Corporation
CResMPA	Climate Resilience Multi Phase Approach
CRIP	Climate Resilience Improvement Project
CRWSP	Resilient Water Safety Planning
CSA	Climate Smart Agriculture
CTCN	Climate Technology Centre and Network
CWWTP	Central Waste Water Treatment Plant
CZ&CRMP	Coastal Zone and Coastal Resource Management Plan
DAD	Department of Agrarian Development
DAPH	Department of Animal Production and Health
DCS	Department of Census and Statistics
DEA	Department of Economic Affairs
DEMs	Digital Elevation Models
DFAR	Department of Fisheries & Aquatic Resources
DMC	Disaster Management Centre
DMT	Department of Motor Traffic
DNBG	Department of National Botanic Gardens
DNCWS	Department of National Community Water Supply
DOA	Department of Agriculture
DSD	Divisional Secretariat Division
DSM	Demand Side Management
DSs	District Secretariats
DWC	Department of Wildlife Conservation
EDB	Export Development Board
EEI&C	Energy Efficiency Improvement and Conservation
EIAs	Environmental Impact Assessments
EMEP	European Monitoring and Evaluation Programme
EOH	Environmental and Occupational Health

EPL	Environmental Protection License
EPR	Extended Producer Responsibility
EPZ	Export Processing Zones
ESAs	Environmentally Sensitive Areas
ETF	Enhanced Transparency Framework
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization
FD	Department Forest Conservation
FFPO	Fauna and Flora Protection Ordinance
FGDs	Focused Group Discussions
GAP	Good Agricultural Practices
GBG	Green Building Guidelines
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoSL	The Government of Sri Lanka
GPS	Global Positioning System
GSMB	Geological Survey and Mines Bureau
GSTC	Global Sustainable Tourism Council
GWP	Global Warming Potential
HARTI	Hector Kobbekaduwa Agrarian Research and Training Institute
HCFCs	Hydrochlorofluorocarbons
HCW	Health Care Waste
HDPE	High-Density Polyethylene
HEM	High Efficiency Motors
HFC	Hydrofluorocarbon
HHAP	Heat-Health Action Plan
HORDI	Horticulture Research and Development Institute
IBRD	International Bank for Reconstruction and Development
ICRAF	International Centre for Research in Agroforestry
ICT	Information and Communication Technology
ICTA	Information Communication Technology Agency of Sri Lanka
ID	Department of Irrigation
IDB	Industrial Development Board
INGOs	International Non-Governmental Organization
IP	Industrial Park
IPCC	Intergovernmental Panel on Climate Change
IPCC-2006	2006 Guidelines of Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
IPNS	Integrated Plant and Nutrition Systems
IPPU	Industrial Processes and Other Product Use
ISO	International Organization for Standardization
ITI	Industrial Technology Institute
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency

KPI	Key Performance Indicator
L&D	Loss and Damage
LAs	Local Authorities
LECO	Lanka Electricity Company
LED	Light Emitting Diode
LKR	Sri Lankan rupee
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LUPPD	Land Use Policy Planning Department
M&E	Monitoring and Evaluation
MASL	Mahaweli Authority of Sri Lanka
MEPA	Marine Environment Protection Authority
MMD&E	Ministry of Mahaweli Development and Environment
MoA	Ministry of Agriculture
MoE	Ministry of Environment
MOH	Medical Officer of Health
MoH	Ministry of Health
MOI	Ministry of Industry
MoIrri	Ministry of Irrigation
MoPE	Ministry of Power, Energy
MoPla	Ministry of Plantations
MoT	Ministry of Tourism
MOT	Ministry of Transport
MoTrad	Ministry of Trade
MoUD&H	Ministry of Urban Development and Housing
MoWL&FC	Ministry of Wildlife and Forest Conservation
MoWS	Ministry of Water Supply
MP	Microplastics
MPAs	Marine Protected Areas
MPG	Modalities, Procedures and Guidelines
MRF	Materials Recovery Facility
MRV	Measurement, Reporting, and Verification
MSW	Municipal Solid Waste
N ₂ O	Nitrous oxide
NaHCO ₃	Sodium bicarbonate
NAITA	National Apprentice and Industrial Training Authority
NAP	National Adaptation Plan
NAQDA	National Aquaculture Development Authority
NARA	National Aquatic Resources Research and Development Agency
NBRO	National Building Research Organization
NC	National Communications
NCCAS	National Climate Change Adaptation Strategy
NCD	Noncommunicable Disease
NCPC	National Cleaner Production Centre
NCRs	Non- Conventional Renewable Energy System
NDA	National Designated Authority
NDC	Nationally Determined Contribution
NE	Not estimated

NEC	National Experts Committee
NECCCA	National Expert Committee on Climate Change Adaptation
NEM	Northeast Monsoon
NERDC	National Engineering Research and Development Centre
NF3	Nitrogen Trifluoride
NG	Natural Gas
NGOs	Non-Governmental Organizations
NGPP	National Green Procurement Policy
NHSPEC	National Strategic Plan for Health Environment and Climate Change
NIPHM	National Institute of Post-harvest Management
NIPO	National Intellectual Property Office
NIR	National Inventory Report
NLDB	National Livestock Development Board
NMT	Non-Motorized Transport
NMVOCs	Non-Methane Volatile Organic Compounds
NO _x	Nitrogen Oxides
NPPD	Department of National Physical Planning
NRW	Non-Revenue Water
NSC	National Steering Committee
NSWMSC	National Solid Waste Management Support Centre
NTC	National Transport Commission
NVQ	National Vocational Qualification.
NWPEA	Northwestern Province Environmental Authority
NWSDB	National Water Supply and Drainage Board
ODS	Ozone Depleting Substances
ODSM	Operation Demand Side Management
OFC	Other Field Crops
PDAPH	Provincial Department of Animal Production and Health
PdoA	Provincial Department of Agriculture
PFCs	Perfluorocarbons
PMC	Planning and Monitoring Committee
PMUs	Project Management Units
PPG	Performance Partnership Grants
PPPs	Public private partnerships
PV	photovoltaic
QA	Quality Assurance
QC	Quality Control
R&D	Research and Development
RCCs	Regional Climate Cells
RCP	Representative Concentration Pathway
RDA	Road Development Authority
RE	Renewable Energy
RECP	Resource Efficient Cleaner Production
REDMAP	Renewable Energy Development Master Action Plan
RET	Renewable Energy Technology
RRDI	Rice Research and Development Institute
RRI	Rubber Research Institute
RS	Remote Sensing

RSPGLoC	Rooftop Solar Power Generation Line of Credit
RWH	Rainwater Harvesting
SAARC	South Asian Association for Regional Cooperation
SCC	Sectoral Climate Cell
SD	Survey Department
SDGs	Sustainable Development Goals
SF ₆	Sulphur hexafluoride
SLCF	Sri Lanka Climate Fund
SLCG	Sri Lanka Coast Guard
SLLDLDC	Sri Lanka Land Development Corporation
SLPA	Sri Lanka Ports Authority
SLR	Sri Lanka Railways
SLSDC	Sri Lanka Sustainable Development Council
SLSEA	Sri Lanka Sustainable Energy Authority
SLTB	Sri Lanka Transport Board
SME	Small and Medium Enterprise
SO _x	Sulphur Oxides
STC	State Timber Corporation
TCZ	Thermal Comfort Zone
TNC	Third National Communication
TRI	Tea Research Institute
TROF	Trees Outside Forests
TSHDA	Tea Small Holdings Development Authority
UDA	Urban Development Authority
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
UOM	University of Moratuwa
USAID	United States Agency for International Development
USD	United States Dollar
VKT	Vehicle Kilometers Traveled
VRI	Veterinary Research Institute
WHO	World Health Organization
WP	Western Province
WPWMA	Western Province Waste Management Authority
WRB	Water Resource Board
WtE	Waste to Energy
WWT	Waste Water Treatment

Executive Summary

Sri Lanka, a developing country, and an island nation lying in the Indian Ocean is highly vulnerable to the adverse impacts of climate change. The per-capita greenhouse gas (GHG) emission of the country is 1.02 tons as per the TNC of Sri Lanka. Despite this status, Sri Lanka is committed to mitigate GHG emissions while taking actions to improve the country resilience and adaptation.

The five chapters of the first Biennial Transparency Report (BTR1) present the country status and information to fulfil the purpose of BTR in line with the modalities, procedures and guidelines (MPGs) as set out by the parties to the UNFCCC and the Paris Agreement.

Chapter 1: National Inventory Report of greenhouse gases

Sri Lanka's greenhouse gas (GHG) inventory for the period of 2011-2021 was prepared as part of its BTR1 in line with the IPCC-2006 and AR5 of the IPCC. The report includes carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions and removals, providing a comprehensive overview of the country's GHG profile.

The total GHG emission excluding LULUCF sector has increased from 25,494.68 Gg CO₂-eq in 2011 to 28,944.20 Gg CO₂-eq in 2021. The total GHG emission including LULUCF sector has showed an increase, from 16,864.68 Gg CO₂-eq in 2011 to 19,052.03 Gg CO₂-eq in 2021.

Energy sector dominated in total GHG emissions, contributing 17,804.39 Gg CO₂-eq in 2011, which increased to 21,699.90 Gg CO₂-eq in 2021. In Agriculture sector, in 2011 the emissions amounted to 6,554.62 Gg CO₂-eq and displayed fluctuations over the years to reach 6,070.11 Gg CO₂-eq in 2021. In IPPU sector, the emissions reduced slightly from 544.29 Gg CO₂-eq in 2011 to 519.29 Gg CO₂-eq in 2021 having displayed fluctuations over the years. In Waste sector, GHG emissions shown an upward trajectory during the period of 2011-2021, with total emissions increasing from 596.0 Gg CO₂-eq to 657.9 Gg CO₂-eq. Net removals of CO₂ increased from 8,634.62 Gg in 2011 to 9,892.17 Gg in 2021, highlighting the LULUCF sector's role as a carbon sink.

CO₂ is the largest contributor to total GHG emissions, increasing from 8,232.30 Gg in 2011 to 11,405.04 Gg in 2021. CH₄ emissions reduced from 8,266.85 Gg CO₂-eq in 2011 to 7,400.89 Gg CO₂-eq in 2021. N₂O emissions reduced from 365.51 Gg CO₂-eq in 2011 to 246.09 Gg CO₂-eq in 2021.

The inventory provides critical insights into Sri Lanka's emission trends, highlighting areas of growth and reduction in GHG emissions across key sectors and in gases.

Chapter 2: Information necessary to track progress made in implementing and achieving Nationally Determined Contributions (NDCs)

Sri Lanka, an island nation in the Indian Ocean, covers 67,240 km² and features diverse ecosystems shaped by 103 river basins, high rainfall (1,000-5,000 mm annually) and temperatures averaging 25-30°C. The country's Energy sector has shifted from hydro-dominated power in the 1990s to a more diverse mix, with renewable energy accounting for 56% of total energy mix (4,813 MW) in 2021. Key renewable energy sources include hydro, wind, solar and biomass supported by the National Energy Policy and Strategies and Carbon

Net Zero 2050 Roadmap and Strategic Plan. Transport sector emissions dominated by road vehicles, highlight the need for sustainable urban mobility solutions.

Industrial activity represents 25.9% of GDP and employs 30% of the workforce. Agriculture focuses on paddy cultivation in 1.4 million ha and fluctuating livestock populations. Forestry, vital for biodiversity and carbon sequestration has declined to 29.2% cover however, remains a critical climate change mitigation and adaptation resource. Waste generation, at 8,141 metric tons estimated per day in 2022, has led to initiatives like composting and waste-to-energy plants. Of which, the Western Province accounts for 41%. Composting is a nature-based solution widely practiced at small and medium scale, while household composting is encouraged at micro level. One waste to energy plant is functioning in the western province.

Sri Lanka submitted its NDCs in 2016 and updated them in 2021 to reflect ambitious mitigation and adaptation goals across key sectors including loss and damage. Mitigation NDCs sectors include energy, transport, industry, waste, forestry and agriculture (including livestock), while Adaptation NDCs focus on agriculture, fisheries, livestock, water, biodiversity, coastal and marine, health, tourism, urban planning and human settlement. Loss and Damage NDC sector is relevant across all sectors.

Sri Lanka's progress toward NDC implementation demonstrates a multi-faceted approach to emissions reduction and resilience building, balancing economic growth with sustainability. Significant strides in renewable energy integration, industrial efficiency and waste management underscore the country's commitment for meeting its climate goals under the Paris Agreement.

Tracking Progress of NDCs in GHG emissions are monitored sector-wise in CO₂-equivalent, with the base year 2021. Electricity (Power) sector mitigation measures target a reduction of 49,093 Gg CO₂-eq by 2030. In 2021, Energy sector emissions showed a 14% decline from the BAU scenario, reflecting the post-2019 economic slowdown and increased renewable energy adoption. The progress achieved in other sectors is not reported in BTR1 and they will be reported in the BTR2.

Sector-wise Mitigation Policies and Measures are highlighted as follows;

Energy: Transitioning to renewable energy, reducing transmission losses and converting fuel-based plants to natural gas.

Transport: Promoting public transport, non-motorized mobility and e-mobility while modernizing urban railways.

Industry: Promoting fuel switching to biomass, circular economy practices and resource efficiency enhancements.

Waste: Accelerating transitions for waste prevention and reduction to minimise final disposal requirements in line with circular economy and limiting non-reusable and non-recyclable inert material for landfilling.

Forestry: Increase tree cover in forests, home gardens, urban areas, grasslands and restoration of degraded wetland and mangrove ecosystems to enhance carbon sequestration and sustain ecosystem services.

Agriculture: Reducing post-harvest losses, improving productivity and integrating renewable energy into livestock operations.

Chapter 3: Information related to climate change impacts and adaptation

Sri Lanka is enriched with diverse ecosystems, including tropical forests, mangroves, wetlands and savannahs which support its rich biodiversity. The island's topography transitions from coastal plains to central highlands, while its climate is significantly influenced by the monsoons, resulting in distinct wet and dry zones. Despite its ecological wealth, Sri Lanka is among the top ten countries that is the most vulnerable to extreme weather events, as indicated by the Global Climate Risk Index.

As of November 2024, Sri Lanka's population is approximately 22 million, growing at a rate of 1.1% annually. Nearly 50% of this population, residing predominantly in the dry zone and coastal areas, remains highly vulnerable to climate change. Key challenges include increasing flash floods and prolong droughts, which disrupt livelihoods and the economy.

The Climate Change Secretariat serves as the central entity overseeing the implementation and monitoring of mitigation and adaptation related NDCs through planning and monitoring committees established in each sector focusing on the key mitigation and adaptation sectors. A National Working Group ensures alignment among these sectors by fostering inter-agency collaboration, addressing cross-sectoral interdependencies and promoting cohesive adaptation initiatives. Additionally, the National Steering Committee for the National Adaptation Plan (NAP) oversees the implementation of the NAP through measurable Key Performance Indicators (KPIs).

Guiding policy instruments for Sri Lanka's adaptive response are as follows;

- **National Environmental Policy 2021** provides a framework for sustainable resource management, aligning national development plans with global sustainable development goals.
- **National Climate Change Policy 2023** addresses climate vulnerabilities, integrates global trends and leverages international funding opportunities to enhance resilience and achieve adaptation and mitigation targets.
- **National Adaptation Plan for Climate Impacts of Sri Lanka 2016-2025** prioritizes the actions of the most vulnerable sectors, emphasizing adaptive capacities for vulnerable communities while aligning with sustainable development objectives.
- **National Environmental Action Plan 2022-2030** provides strategies to tackle modern environmental challenges, advancing SDGs and filling gaps left by previous national action plans.
- **Carbon Net Zero 2050 Roadmap and Strategic Plan** is the Long-Term Low Emission Development Strategy (LTLEDS) which provides an attempt to set the stage to transition to net zero pathways, proposing climate actions to achieve the national commitments in long run.

Temperature in the country has risen by 0.4°C since 1961, with projections indicating an increase of up to 2.4°C by 2050, while erratic monsoonal patterns and reduced annual rainfall in key agricultural zones worsen water scarcity and food security risks. Extreme weather events observed in the country are increased floods, droughts, landslides and storm surges significantly disrupting livelihoods and infrastructure, particularly in vulnerable areas.

Priority areas for adaptation includes food security, water security, energy security, human health, infrastructure resilience, environmental integrity for aiming to build resilience, safeguard livelihoods and poverty eradication. Identified barriers for implementing adaptation measures include: limited financial resources, insufficient technology development and transfer, insufficient capacity building of human resources and institutional setup, inadequate data management on adaptation and vulnerabilities, and lack of research on potential adaptation measures.

From 2021 to 2022, 60% of planned adaptation activities were completed despite financial constraints, with progress in integrating adaptation into policies and enhancing resilience in key sectors.

Chapter 4: Financial, technology development and transfer and capacity building support needed and received

Sri Lanka's unique national circumstances as a developing country necessitates targeted support to bridge significant resource gaps. The methodologies employed include stakeholder engagement, focus group discussions, and alignment with global climate frameworks, ensuring that identified priorities are both actionable and sustainable.

Sri Lanka requires substantial financial resources to implement its climate commitments, particularly in key sectors such as renewable energy, agriculture, water resources, and disaster resilience. While international climate finance mechanisms have provided support, gaps remain in meeting the full scale of the country's needs. Financial assistance received up to 2021 has been instrumental in initiating adaptation and mitigation projects, though further support is essential for scaling up the best practices for building resilience and low carbon development pathways.

The development and transfer of advanced technologies are critical to enhancing Sri Lanka's adaptive capacity and reducing its GHG emissions. While international collaborations and technology-sharing platforms have provided some supports, barriers such as limited infrastructure and expertise hinder full implementation.

Sri Lanka has identified the need of capacity buildings on identified potential adaptation and mitigation measures, and implementing them, climate data management, community engagement and project monitoring and evaluation. Programs and training sessions supported by international partners have made a considerable progress in addressing these gaps, however sustained efforts are required to build long-term resilience through capacity building.

Support for transparency-related activities, including data collection and reporting, has helped Sri Lanka to establish baseline metrics. However, additional assistance is required to integrate advanced monitoring tools and build capacity for regular reporting under the Enhanced Transparency Framework of the Paris Agreement.

While Sri Lanka has benefited from international support across financial, technological, and capacity-building domains, significant gaps remain in fully addressing the country's climate needs. Strategic alignment with the Paris Agreement, enhanced global partnerships, and increased funding will be pivotal in achieving the country's climate goals and advancing sustainable development.

While Sri Lanka has made strides in implementing climate adaptation and mitigation strategies, several systemic challenges hinder the full realization of these strategies. A primary concern is the lack of clear institutional coordination, with ambiguous roles and responsibilities among the agencies involved in NDCs implementation. This absence of full-scale functioning of the well-established governance structures limits the effectiveness of monitoring, reporting and verification (MRV) processes, which are essential for accurate and timely reporting under the Paris Agreement. Moreover, deficiencies in the country's information management systems restrict the efficient collection, integration and analysis of climate-related data, impeding decision-making and progress tracking.

Drawing from expert opinions and stakeholder consultations, the chapter identifies key recommendations for addressing these gaps. These include;

Strengthening Institutional Coordination: Clearer delineation of roles, responsibilities and communication pathways among key stakeholders are needed to improve collaboration and ensure that actions align with national climate goals.

Enhancing Information Management: Developing centralized and integrated data management systems will streamline the collection, storage, and dissemination of climate-related data, making it more accessible and actionable for policy decisions and reporting.

Capacity Building: Training programs for personnel involved in climate actions implementation, monitoring, reporting and verification will help build technical expertise and improve the quality of the data and processes necessary for effective implementation and reporting.

Gender Integration: Incorporating gender-sensitive approaches in climate action strategies is vital to address inequalities, ensuring that both women and marginalized groups contribute effectively to and benefit from climate initiatives.

Stakeholder Engagement: Promoting broader participation from diverse stakeholders, including the private sector, civil society and local communities will foster a more inclusive approach to climate action and improve the monitoring of NDCs.

Chapter 5: Areas to be improved and other relevant information including gender

Sri Lanka has made remarkable progress in developing policies, strategies, action plans, programmes related for climate change mitigation and adaptation. However, challenges persist in ensuring effective coordination, monitoring and implementation of these efforts. Key gaps include the need for robust data collection systems, legal frameworks for cross-sectoral data sharing and improved institutional and technical capacities. There is also insufficient data availability for key sectors, limiting the effectiveness of climate actions.

To address these challenges, strengthening the Monitoring, Reporting, and Verification (MRV) systems and aligning NDCs with the National Inventory Report (NIR) is critical. The country also requires comprehensive research on the impacts of climate change and improved funding support for adaptation and mitigation actions. Regular assessments of financial, technology transfer, and capacity-building needs are essential for tracking and reporting progress, ensuring that Sri Lanka can enhance its climate resilience in the long term.

CHAPTER 1

National Inventory Report of greenhouse gases

Chapter 01

National Inventory Report of greenhouse gases

1.0 Overview

The Third National Communication of Climate Change in Sri Lanka (TNC), submitted in 2022, provides a detailed assessment of anthropogenic greenhouse gas (GHG) emissions and removals for the period of 2000 to 2011. The National Inventory Report (NIR) of the first Biennial Transparency Report (BTR1) covers the years from 2011 to 2021. The inventory is prepared in accordance with the 2006 Intergovernmental Panel on Climate Change (IPCC) guidelines, incorporating subsequent refinements where applicable. The Energy, Industrial Processes and Product Use (IPPU), Agriculture, Forestry and Other Land Use (AFOLU) and Waste sectors emissions were reported under BTR1.

As a Non-Annex 1 Party to the United Nations Framework Convention on Climate Change (UNFCCC), Sri Lanka is required to estimate anthropogenic emissions from sources and removals by sinks of key GHGs, including carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). For the period from 2011 to 2021, Sri Lanka's NIR was prepared using the IPCC-2006, primarily employing the Tier-1 methodology. The inventory covers emissions across multiple sectors, including Energy, IPPU, Agriculture, Land Use, Land Use Change and Forestry (LULUCF), and Waste. Emissions and removals in the AFOLU sector are reported separately under Agriculture and LULUCF sectors.

1.1 National circumstances and institutional arrangements

Established in 2008 under the Ministry of Environment, the Climate Change Secretariat (CCS) of Sri Lanka functions as the Operational Focal Point to the UNFCCC and the Paris Agreement. The CCS was established to implement the decisions taken by the UNFCCC and to coordinate climate change related actions of the national level stakeholders. The GHG inventory for BTR1 was developed under the oversight of the CCS. The role of the CCS in the GHG inventory is to coordinate and facilitate with the relevant stakeholders. Sri Lanka's emissions of CO₂, CH₄ and N₂O and non-CO₂ GHG precursors were estimated across the sectors mention in Table 1.1 provides a comprehensive overview of emissions distribution by sector.

1.2 Methodologies, Parameters and Data

The preparation of the NIR for the BTR1 was carried out with the support from a team of sector-specific experts, ensuring a comprehensive and collaborative approach. Nationally available activity data were prioritized wherever feasible, and pre-defined data templates aligned with the IPCC-2006 worksheets were employed to standardize data collection.

Sri Lanka adhered to the IPCC-2006 with its 2019 refinements in estimating anthropogenic GHG emissions from sources and removals by sinks. Specifically, the IPCC Inventory Software version 2.93 was employed for calculations, key category analysis, and uncertainty assessments. Tier 1 methods were consistently implemented in all subsectors. Emissions and removals aggregated using CO₂ equivalents (CO₂-eq) for 100-year global warming potential (GWP) values of the AR5 of IPCC are mentioned in Annex 2. The NIR includes emissions of

CO₂, CH₄ and N₂O which are the primary GHGs monitored and reported in accordance with international climate reporting standards.

The NIR encompasses a comprehensive assessment of emissions and removals across the sectors mentioned in the Section 1.0. Activity data required for estimating GHG emissions and removals were gathered from relevant agencies and institutions. Close collaboration with sectoral experts and stakeholders was integral to maximizing the use of available national data and expertise, enhancing the robustness of the inventory process. Annex 3 provides a summary of the sources for the activity data.

No recalculation of the GHG time series was conducted, as the inventory development followed the same methodology used in the preparation of the TNC.

1.2.3 Quality Assurance and Quality Control (QA/QC)

Comprehensive QA/QC procedures were implemented during the inventory preparation process. Emission estimates, activity data, and emission factors were periodically verified, and discrepancies were resolved through consultations with experts and stakeholders. Data gaps were addressed using expert opinions, all methodologies, data sources, and assumptions were documented. Worksheets were rechecked to ensure accuracy in data and units. The details are tabulated in Annex 20.

1.2.4 Process for the official consideration and approval of the NIR

A systematic review process, including consultations with relevant government agencies, stakeholders, and technical experts was conducted to validate the accuracy and comprehensiveness of the NIR. A draft report prepared by the inventory preparation team was submitted to the national focal point for final consideration, where feedback and revisions were incorporated to align with national priorities. Further, the national focal point appointed an independent review panel to technically review the NIR. The finalized inventory was officially approved and endorsed, ensuring compliance with national and international reporting standards.

1.3 Trends in GHG emissions and removals by sector

The most significant GHG emitted in Sri Lanka is CO₂, primarily produced by the burning of fossil fuels to generate energy used by the industries, household & commercial buildings and transport sectors. Given Sri Lanka's small land size and landscape, GHG emissions from the AFOLU sector are negligible in comparison with other economic sectors and the size of the carbon stocks.

Figure 1.1 provides a comprehensive overview of GHG emissions in Gg CO₂-eq from 2011 to 2021, factoring in the net value of the LULUCF sector. Throughout the period, the LULUCF sector consistently acted as a carbon sink, offsetting a significant portion of emissions from other sectors. Its negative values underscore its critical role in reducing the overall emissions. Compared to Figure 1.2, Figure 1.1 highlights the substantial sectoral contribution to reduce the total emissions.

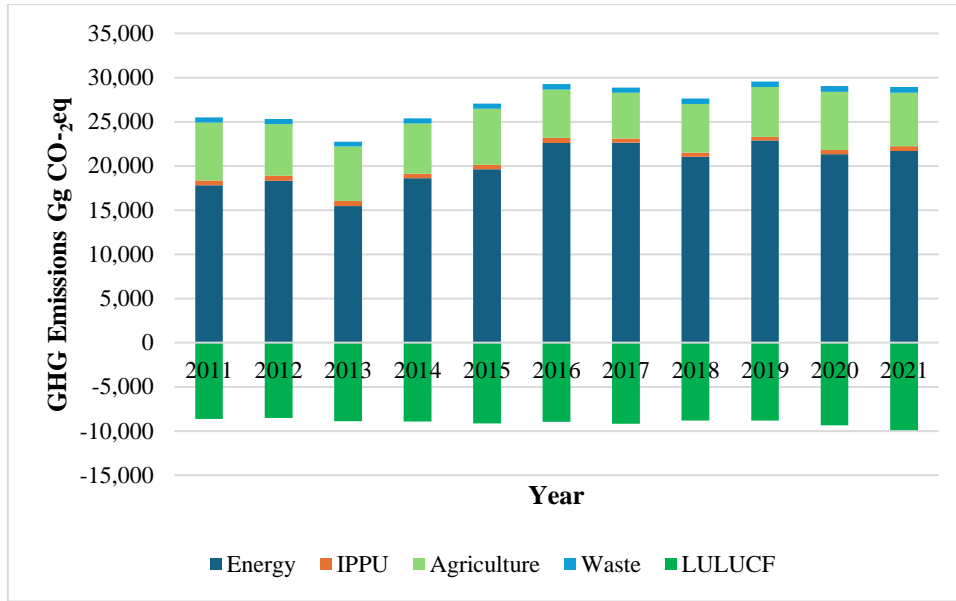


Figure 1.1: Sector-wise GHG emissions and removals including LULUCF net value

The Energy sector remains the dominant source of emissions, followed by Agriculture, Waste and IPPU. Gross emissions stabilize slightly after 2019, potentially reflecting the impact of mitigation measures.

The LULUCF sector continues its steady contribution to emission reductions, and enhancing land management practices and conservation efforts could further amplify its carbon sink potential, supporting broader climate goals.

Figure 1.2 illustrates GHG emissions in Gg CO₂-eq from 2011 to 2021, excluding the LULUCF sector.

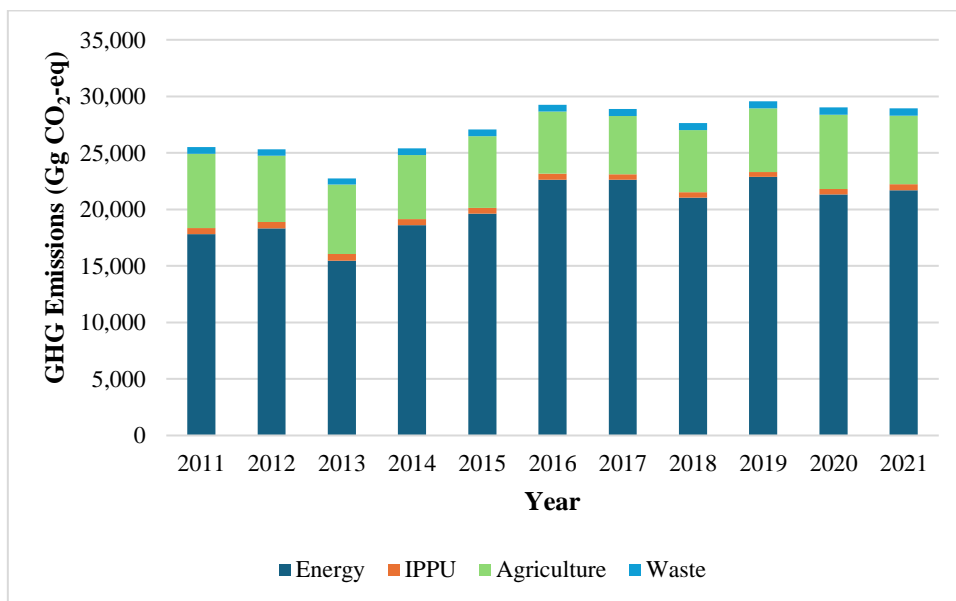


Figure 1.2: Sector-wise GHG emissions excluding LULUCF sector

CO₂ contributes the largest share of emissions in every year, indicating the significant impact of fossil fuel combustion and industrial activities. There is a steady increase in CO₂ emissions from 2011 to 2017, with stabilization or slight declines observed from 2018 onwards.

CH₄ represents the second-largest contributor to emissions. It is primarily attributed to agriculture (e.g., enteric fermentation) and waste management. The CH₄ emissions exhibit relatively consistent levels throughout the time period.

N₂O is the smallest contributor but remains significant. Emissions from agricultural soil management are likely a major source of emissions. The trend for N₂O is stable, with minor year-to-year fluctuations. Total emission of all the gases steadily increases from 2011 to 2017, peaking in 2017. From 2018 onwards, there is a stabilization or slight reduction in total emissions. Figure 1.3 illustrates GHG emissions in Gg CO₂-eq categorized by gases: CO₂, CH₄ and N₂O.

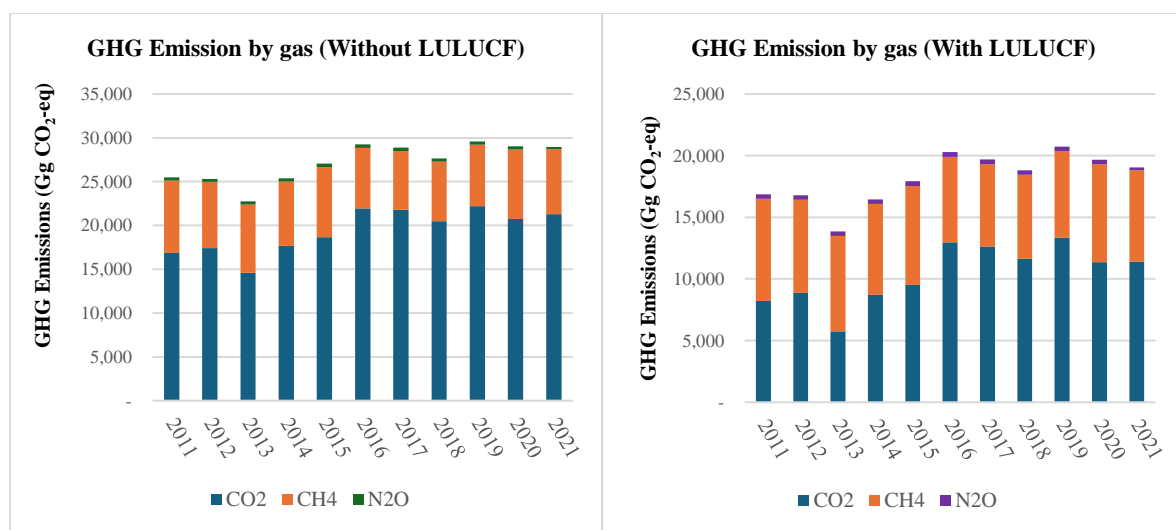


Figure 1.3: GHG emissions by gas across all sectors

Figure 1.3 highlights a noticeable reduction in total emissions. The most significant reduction was observed from 2011 to 2014, when LULUCF sector's offset impact was relatively higher. While CO₂ emissions remain the largest contributor, their levels are lower when the LULUCF sector effect is considered, reflecting the carbon absorption by forests and other land uses.

The breakdown highlights the critical need for targeted strategies to reduce emissions of all three gases. While CO₂ reduction remains paramount due to its volume, addressing CH₄ and N₂O emissions especially in agriculture and waste sectors offers substantial opportunities for mitigation. These gases have higher GWPs than CO₂, making their management a key part of achieving climate goals.

CH₄ and N₂O gases show very low emissions compared to the other emissions with LULUCF sector and remain largely consistent, similar to the "Without LULUCF Sector" (Figure 1.3). Net emissions stabilize or slightly decline post-2018, likely due to a combination of LULUCF sector's sustained role and potential emission reductions from other sectors. Emissions peak around 2017 but gradually decline thereafter, suggesting improvements in emission management practices or enhanced contributions from the LULUCF sector. Figure 1.3 also

presents GHG emissions and removals by gas and sectors, emphasizing the crucial role of the LULUCF sector in overall emissions reduction.

1.3.1 Total national emissions

In 2021, national net GHG emissions were dominated by the Energy sector, which accounted for 20,684.02 Gg of CO₂, 28.15 Gg of CH₄, and 0.85 Gg of N₂O. The entirety of net CO₂ emissions at the national level was attributed to this sector, underscoring its significant impact on the national emissions profile. The data emphasizes the need for targeted emission reduction strategies in the transport and electricity generation sub-sectors to tackle major emission sources within the Energy sector. Table 1.1 shows the GHG Emissions summary.

Table 1.1: Summary of GHG emissions and removals in GgCO₂-eq

Year	Energy	IPPU	Agriculture	Waste	LULUCF
2011	17,804.39	544.29	6554.62	596.00	-8634.62
2012	19,179.46	572.63	5865.25	577.80	-8539.19
2013	15,707.22	592.71	6143.18	552.90	-8899.95
2014	18,836.68	531.36	5688.93	572.90	-8935.98
2015	19,354.35	495.30	6343.93	585.40	-9135.28
2016	21,678.97	552.24	5488.76	595.50	-8965.29
2017	24,342.37	489.61	5163.60	606.30	-9176.46
2018	22,656.76	472.46	5506.68	620.40	-8836.56
2019	23,134.44	429.71	5641.14	629.80	-8836.56
2020	21,598.28	486.70	6574.50	647.70	-9366.93
2021	21,699.90	519.29	6070.11	657.90	-9892.17

Key category analysis: The key category analysis was conducted to identify the major contributors to the national GHG inventory. The analysis was conducted for the starting year and the latest reporting year, including and excluding the LULUCF sector categories, using approach 1, for both level and trend assessment. Annex 4 presents the key category analysis of GHG emissions by sector and subsector, highlighting both the level and trend assessment.

1.3.2 Energy sector

Transportation and power generation are the dominating GHG emission activities in the Energy sector in Sri Lanka. The anthropogenic GHG emissions from sub sectors of Energy sector of Sri Lanka calculated using the IPCC-2006 and the 2006 IPCC default emission factors are given in this section. The Energy sector activity data (i.e. energy generation and fuel consumption data) are available in the national energy balance statements published by the Sri Lanka Sustainable Energy Authority (SLSEA) annually and the data were obtained from 2011-2021 statements. The data include the fuel consumption for electricity generation and other energy needs in industries, transport, household, commercial and agricultural sectors. Hence, the emissions from the Energy sector mainly from fuel combustion activities consists of following sub activities:

- Electricity generation (1.A.1.a.i)
- Petroleum refining (1.A.1.b)
- Manufacturing industries & construction (1.A.2.m)

- Transport (1.A.3)
 - Road transportation (1.A.3.b.i)
 - Rail transportation (1.A.3.c)
 - Civil aviation (1.A.3.a.ii)
- Other sectors (1.A.4)
 - Household consumption (1.A.4.b)
 - Agriculture (1.A.4.c)

1.3.2.1 Methodology

The following key considerations guided the preparation of the GHG Inventory:

1. The 2006 IPCC Tier-1 methodology was applied, using default emission factors due to concerns over the validity and accuracy of certain nationally available emission factors.
2. AR5 GWPs (100 years' time horizon) were used.
3. Emphasis was placed on gathering and using the nationally available published activity data from National Energy Balance statements published by SLSEA.
4. IPCC Software, version 2.93 released on Aug. 2024 was used for inventory calculation, key category analysis and uncertainty analysis.
5. Content of GHG inventory was validated by key stakeholders of the sector.

Annex 5 indicates the activity data identified in the Energy sector.

Fuel types reported in the national energy balance statements against the respective fuel categories of the IPCC are tabulated in Annex 6.

1.3.2.2 Fuel consumption in Energy sector

- **Electricity Generation**

Figure 1.4 illustrates the thermal energy emitted in Terajoules (TJ) by each fuel category from 2011 to 2021 period. Naptha has the lowest contribution where the coal being the main player in the Energy sector.

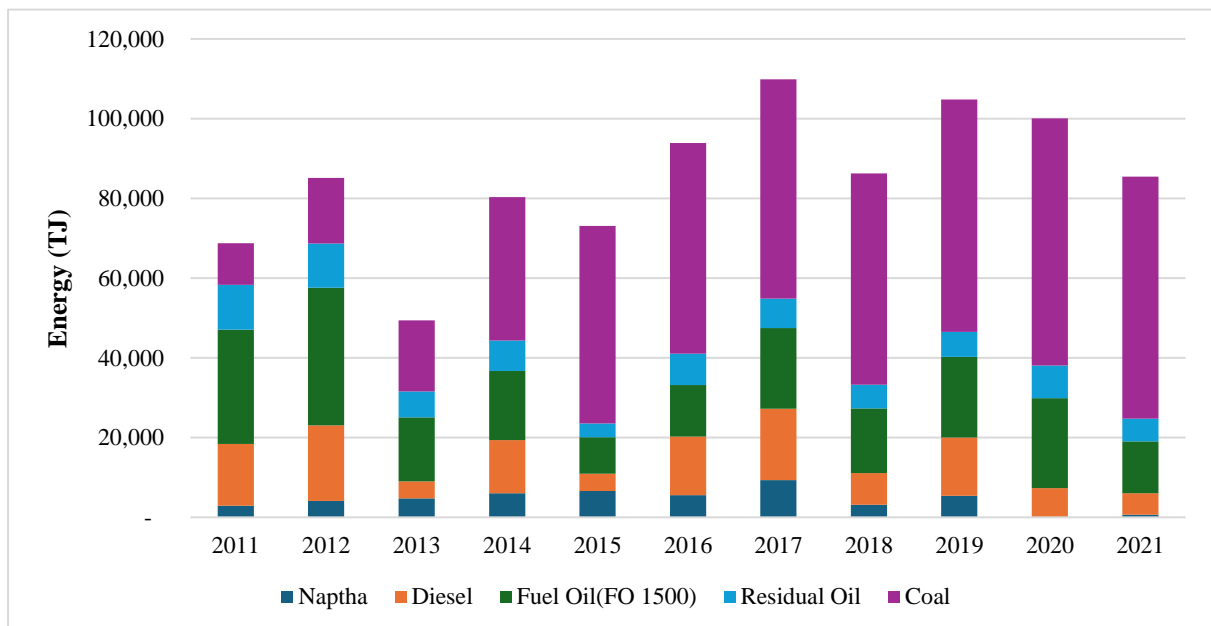


Figure 1.4: Fuel usage in energy generation

- **Transport**

Figure 1.5 illustrates the energy consumption in TJ across different transportation modes: Road Transport, Rail Transport, and Domestic Aviation from 2011 to 2021. Road Transport consistently shows the highest energy consumption across the years, with a noticeable increase from 2011 to a peak in 2017 and 2018. After 2018, energy use in Road Transport dips slightly but remains high. Rail Transport and Domestic Aviation consume significantly less energy by comparison, with both showing relatively minimal fluctuations over the years.

The data suggests a strong reliance on road transport in the Energy sector for transportation, while other modes contribute a smaller but steady share. The drop in total energy consumption around 2019 and 2020 could reflect the impact of external factors, such as economic shifts or reduced travel demand, possibly influenced by events like the COVID-19 pandemic.

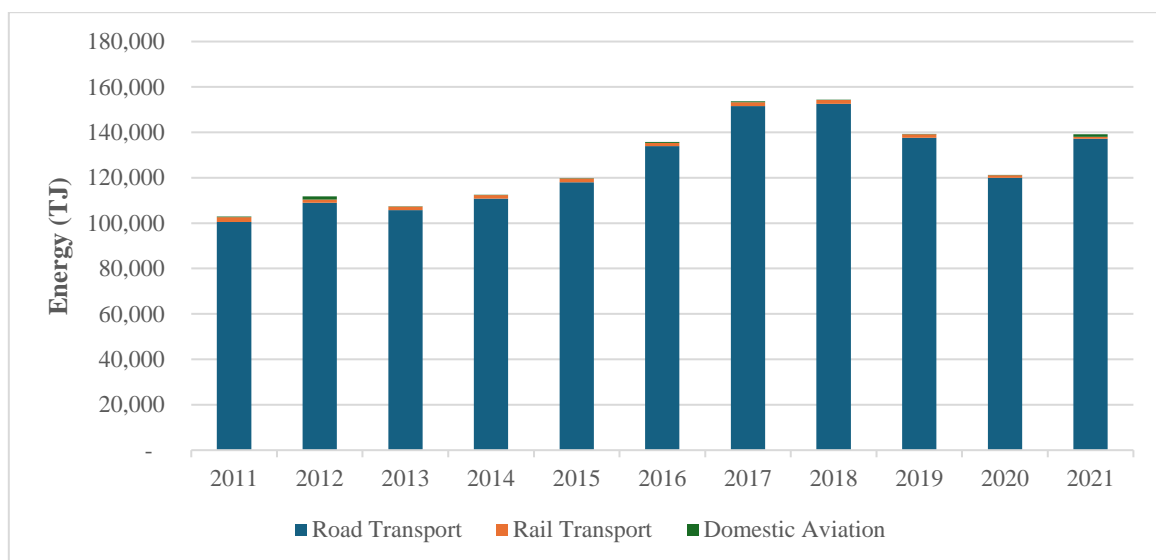


Figure 1.5: Trends in transportation energy consumption

- **Household & Commercial Energy Consumption**

Figure 1.6 displays energy consumption by fuel type: LPG, kerosene, diesel, fuel oil (FO 1500), and firewood across households and commercial sectors from 2011 to 2021. Firewood is the dominant fuel source, contributing the highest energy consumption each year, although there is a noticeable decrease from 2018 onwards. Other fuels, such as LPG, kerosene, and diesel, are used in much smaller quantities compared to firewood, with relatively stable usage patterns over the years. LPG shows a modest increase, particularly in later years, while kerosene and diesel remain minimal. Fuel oil consumption is consistently low, with minor fluctuations.

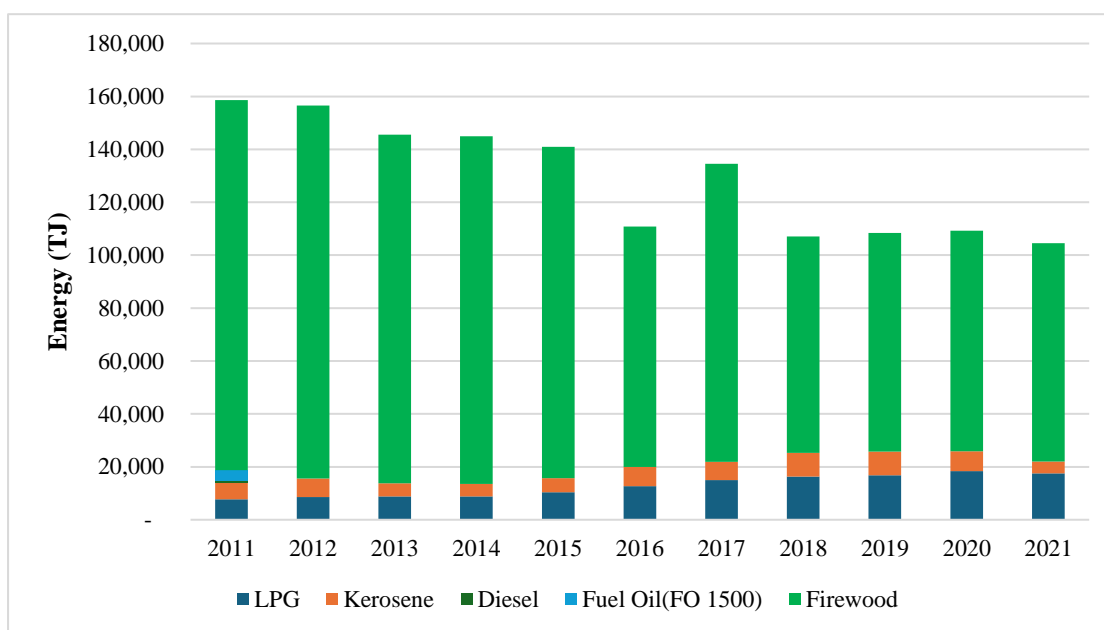


Figure 1.6: Household & commercial energy consumption by type of fuel

The trend highlights a reliance on firewood in the household and commercial sectors, though a shift appears around 2019, suggesting a gradual move towards alternative or more conv fuel sources. This decrease in Firewood usage may reflect an effort to reduce dependence on traditional biomass, possibly influenced by policies or changing energy preferences.

1.3.2.3 GHG annual emissions in the Energy sector

Figure 1.7 shows the GHG emissions in Gigagrams of CO₂-equivalent (Gg CO₂ eq) from 2011 to 2021 in the Energy sector including the following sub categories: 1.A.1 - Energy Industries, 1.A.2 - Manufacturing Industries and Construction, 1.A.3 - Transport and 1.A.4 - Other Sectors. It depicts the contributions of CO₂, CH₄, and N₂O to total GHG emissions over the period, showing how each gas has contributed to overall emissions levels.

The peak emissions periods and subsequent declines indicate dynamic changes in GHG emissions over time, possibly due to environmental policies, technological advances, or broader economic changes. The data gap in 2016 is an anomaly, but overall, the figure reflects a potential shift towards lower emissions in recent years.

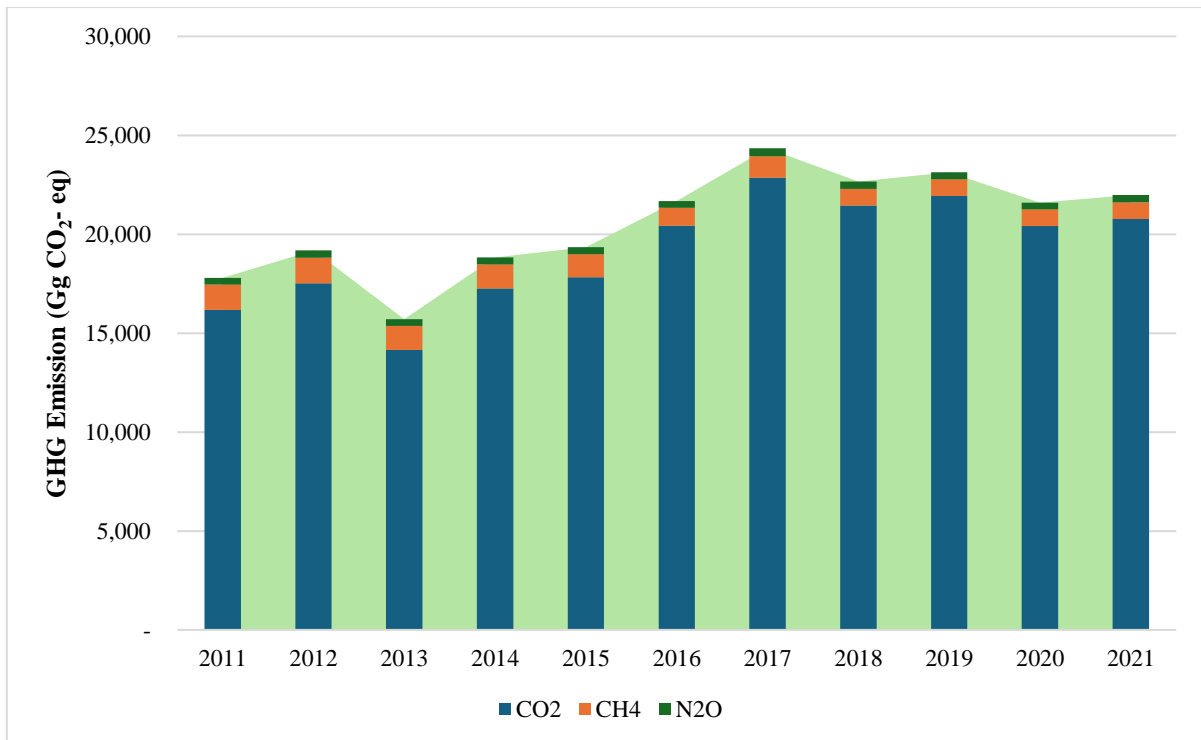


Figure 1.7: GHG emissions in the Energy sector (2011 – 2021)

Annex 7 shows a clear trend of CO₂ becoming increasingly dominant in total emissions, while CH₄ and N₂O emissions remain stable or decrease over time. Emissions peaked around 2017–2018, followed by declines in subsequent years, possibly reflecting the impact of energy and industrial changes influenced by environmental regulations or external factors like the pandemic. The recent reduction in total emissions suggests progress toward lower-carbon and more sustainable practices.

Disaggregated emissions tracking by subsectors like road, rail, air, and maritime transport enables targeted mitigation efforts. The rising trend in emissions highlights the critical need for effective and timely interventions to achieve sustainable transport goals. Annex 8 highlights the trends in GHG emissions in Sri Lanka's transport sector from 2011 to 2021.

Total emissions have increased by 13.5% compared to 2011 while the GDP increased by 32% by 2021. The corresponding values are tabulated in Annex 1.

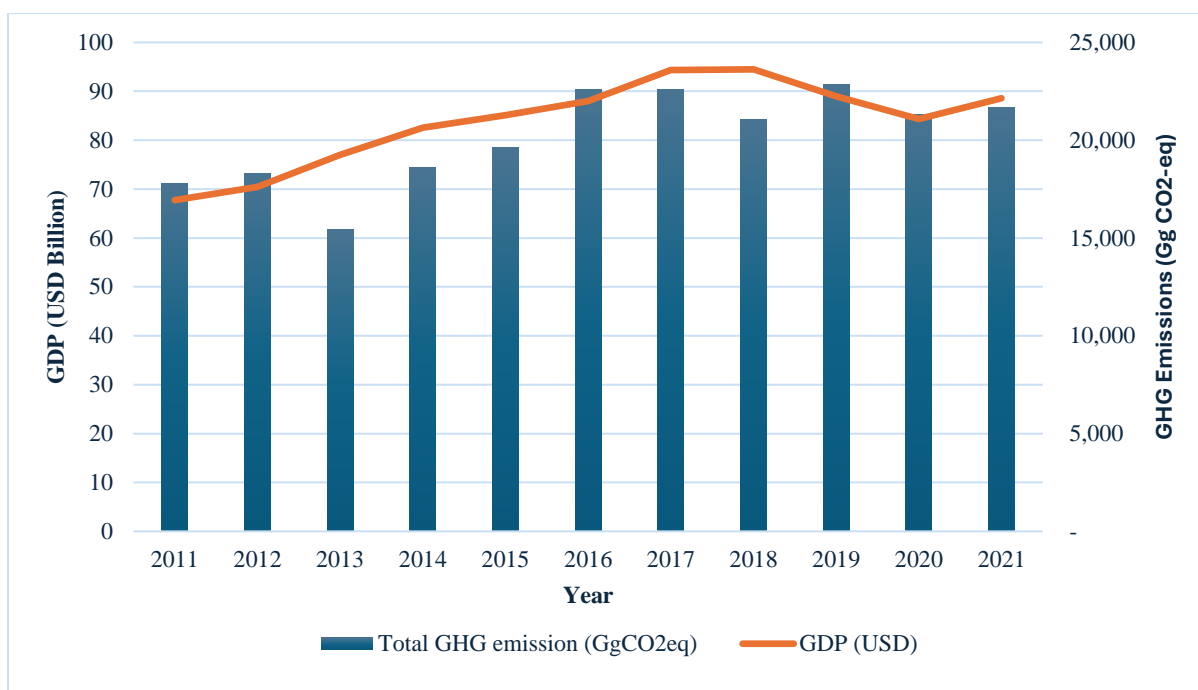


Figure 1.8: Change in GHG emissions in the Energy sector against GDP

1.3.2.4 Summary: Energy sector GHG emissions (2021)

The 2021 GHG emissions data for the Energy sector provides a comprehensive breakdown across various subcategories as illustrated in Table 1.2. Emissions are recorded in gigagrams (Gg) for CO₂, CH₄, and N₂O. The detailed breakdown provides essential data for targeting emission reduction strategies across the Energy sector.

In 2021, the Energy sector's GHG emissions profile was driven predominantly by fuel combustion activities, with substantial contributions from transport and energy industries. Road transportation and electricity generation were the largest sources of CO₂ emissions within the sector. CH₄ and N₂O emissions, though lower in volume compared to CO₂, made significant contributions, particularly from sectors such as road transportation and manufacturing industries.

Table 1.2: Detailed summary of GHG emissions (2021)

Categories	Emissions (Gg CO ₂ -eq)			Total (Gg CO ₂ -eq)
	CO ₂	CH ₄	N ₂ O	
1 - Energy	20,684.02	788.18	224.69	21,696.90
1.A - Fuel Combustion Activities	20,684.02	788.18	224.69	21,696.90
1.A.1 - Energy Industries	7,905.57	12.94	39.76	7,958.27
1.A.1.a - Main Activity Electricity and Heat Production	7,730.90	12.74	39.38	7,783.02
1.A.1.a.i - Electricity Generation	7,730.90	12.74	39.38	7,783.02
1.A.1.b - Petroleum Refining	174.67	0.2	0.38	175.25
1.A.2 - Manufacturing Industries and Construction	1,164.03	74.94	95.18	1,334.15

1.A.2.m - Non-specified Industry	1,164.03	74.94	95.18	1,334.15
1.A.3 - Transport	9925.21	2.29	0.51	9928.01
1.A.3.a - Civil Aviation	82.18	0.00	0.00	82.18
1.A.3.a.ii - Domestic Aviation	82.18	0.00	0.00	82.18
1.A.3.b - Road Transportation	9616.22	2.27	0.48	9618.96
1.A.3.b.i - Cars	4286.45	1.01	0.21	4287.67
1.A.3.b.ii - Light duty trucks	1506.04	0.35	0.08	1506.47
1.A.3.b.iii - Heavy duty trucks and Buses	583.42	0.14	0.03	583.59
1.A.3.b.iv - Motorcycles and Three-wheelers	3240.31	0.76	0.16	3241.24
1.A.3.c - Railways	61.50	0.00	0.02	61.52
1.A.3.d - Water-borne Navigation	165.02	0.02	0.00	165.04
1.A.3.e - Other Transportation	0.30	0.00	0.00	0.30
1.A.4 - Other Sectors	1,689.21	698.01	89.24	2,476.47
1.A.4.b - Residential	1,427.62	696.99	88.66	2,213.27
1.A.4.c - Agriculture/LULUCF/Fishing/Fish Farms	261.59	1.02	0.58	263.2
1.A.4.c.i - Stationary	261.59	1.02	0.58	263.2

1.3.3 Industrial Processes and Product Use (IPPU) sector

1.3.3.1 Overview

As per the IPCC-2006, there are 8 numbers (A to H) of IPPU categories but in Sri Lanka IPPU sector involves in only few categories of them.

In the mineral industry category (2A), Sri Lanka engages in cement, glass, lime, and ceramic production. The cement industry is limited to a few factories, with only one major glass manufacturing facility using mineral raw materials. Lime production operates as a cottage industry, and ceramic production involves a small number of factories. There is not any chemical industry (2B) in Sri Lanka which manufactures products defined in 2B1 to 2B10 in IPCC-2006. There are few metal industries (2C) but none of them involve in production of metals using ores. Most of them manufacture metal products using imported billets and few uses scrap metals.

1.3.3.2 Methodologies

The GHGs and emissions of precursors were estimated using the 2006 IPCC methodology and the nationally available activity data.

The methodology from IPCC-2006 based on activity data from carbonate raw material and default emission factors was used to estimate emissions in the sub-categories of IPPU sector.

Most of the data needed for the 2006 IPCC methodology was not properly recorded or available in the country. The Annual Survey of Industries by the Department of Census and Statistics covers all the economic activities including mining, quarrying and manufacturing among others. There was no publication available with the data or information on the actual physical

output of the industries. Hence, most of the data was collected directly from the relevant industries. A major source of emissions is the industrial processes that chemically and physically transform materials such as carbonates that release a significant amount of CO₂. During these processes CO₂, CH₄ and N₂O can be produced. In addition, HFCs and PFCs often used in products such as refrigerators, foams or aerosol cans, as alternatives to Ozone Depleting Substances (ODS), have been considered as possible sources of emissions in IPPU sector but not reported under the inventory since Sri Lanka reports those under the Montreal Protocol.

1.3.3.3 GHG emissions in sub sectors of IPPU

Under the IPPU sector, sub-sectors such as cement, ceramics, lime, glass, chemicals, metals, solvent applications, surface coating, wood preservative applications, spirit manufacturing, and fluorinated compounds were considered for calculating emissions. These sub-sectors are further categorized into two groups: mineral industries and non-mineral industries. The mineral industry category includes the cement, ceramics, lime, and glass industries, which emit CO₂ when carbonate molecules dissociate during combustion, releasing CO₂.

The data on mineral production in the country is published in the *Mineral Yearbooks* by the Geological Survey and Mines Bureau (GSMB); however, the publication is only available up to 2015. Although the GSMB continues to collect annual production data for years after 2015, segregated data on the quantities consumed by different industries is not available.

For the cement, ceramics, and glass industries, which consist of only a few factories in Sri Lanka, annual data on raw material usage is available. However, the lime industry operates as a cottage industry, and data on dolomite and limestone consumption is not directly available. The estimation assumes that production in a given year is entirely consumed within the same year. The same sub-sectors considered in the TNC were also considered for GHG emissions in this report.

A) Cement industry

Sri Lanka's cement industry comprises a few factories, with only one manufacturing clinker locally using limestone and dolomite, while the others rely on imported clinker for cement production. Data on raw material consumption and production quantities for 2011–2021 was sourced directly from the local clinker manufacturer. Although total cement production data was available for each manufacturer, disaggregated data by category was not provided, limiting the use of the IPCC Tier-1 Methodology. Consequently, CO₂ emissions were estimated using the factor 0.52 times the clinker produced, as specified in Equation 2.4 of the IPCC-2006 for Mineral Industry Emissions. This emission factor includes lime additions but excludes emissions from dolomite combustion. Annex 9 presents the calculated CO₂ emissions from clinker production in kilns.

Trends of GHG emission from cement production are illustrated over the period in Figure 1.9.

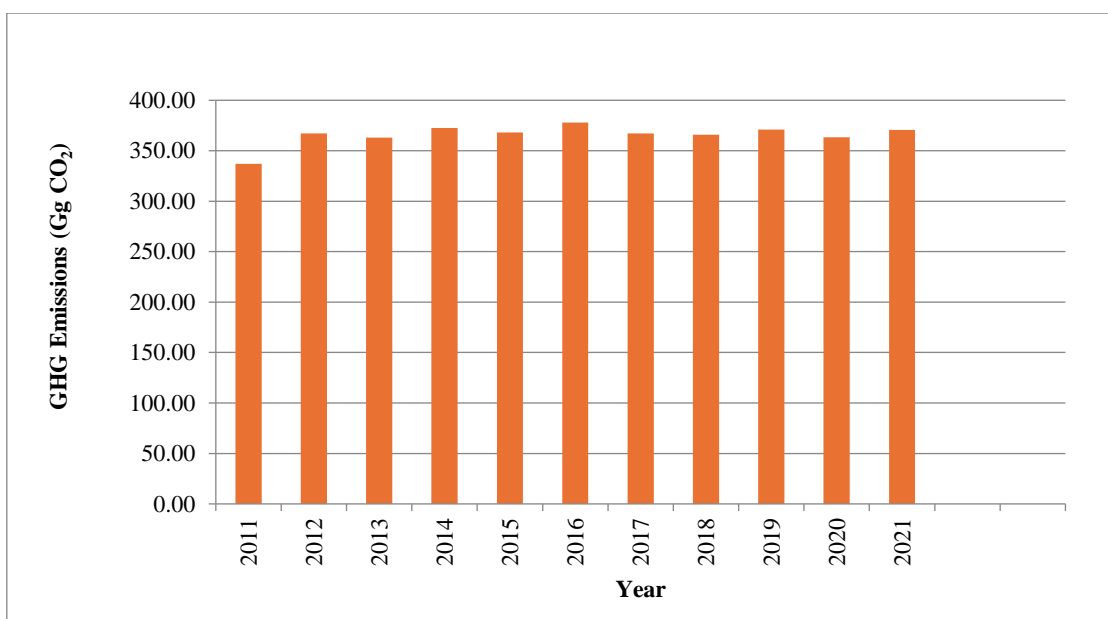


Figure 1.9: GHG emissions from the Cement industry

B) Lime industry

Burning limestone or dolomite to manufacture lime releases CO₂. The amount of dolomite used in lime production was obtained after deducting the quantities consumed in other industries including fertilizer, cement, ceramics and glass from the total production of dolomite. Dolomite consumption data for the fertilizer usage for the period 2011 to 2014 is not available and therefore consumption for those years were estimated based on the data of average of the recent 3 years. There were some issues in the total limestone consumption data in 2015 and 2019/20 and those were corrected based on the data on rest of the years. The amount of limestone used in lime industry is estimated by deducting limestone consumption of cement industry. Limestone consumption in other activities is considered negligible. The emission factors for limestone and dolomite are taken as 0.440 tCO₂/tonne of Calcite and 0.477 tCO₂/tonne of dolomite respectively. Annex 10 shows the CO₂ emission in lime production.

Figure 1.10 illustrates the CO₂ emissions of lime production.

C) Glass industry

Sri Lanka has only one major glass manufacturing factory, which produces glass out of mineral raw material including soda ash (Sodium bicarbonate- NaHCO₃) and dolomite. The consumption data of soda ash, dolomite and calcite were provided by the factory. The emission estimates are given in Annex 11. Emission factors for soda ash, dolomite and calcite were used as 0.415, 0.477 and 0.44 tCO₂/tonne respectively.

Figure 1.11 shows the GHG emissions from the glass industry.

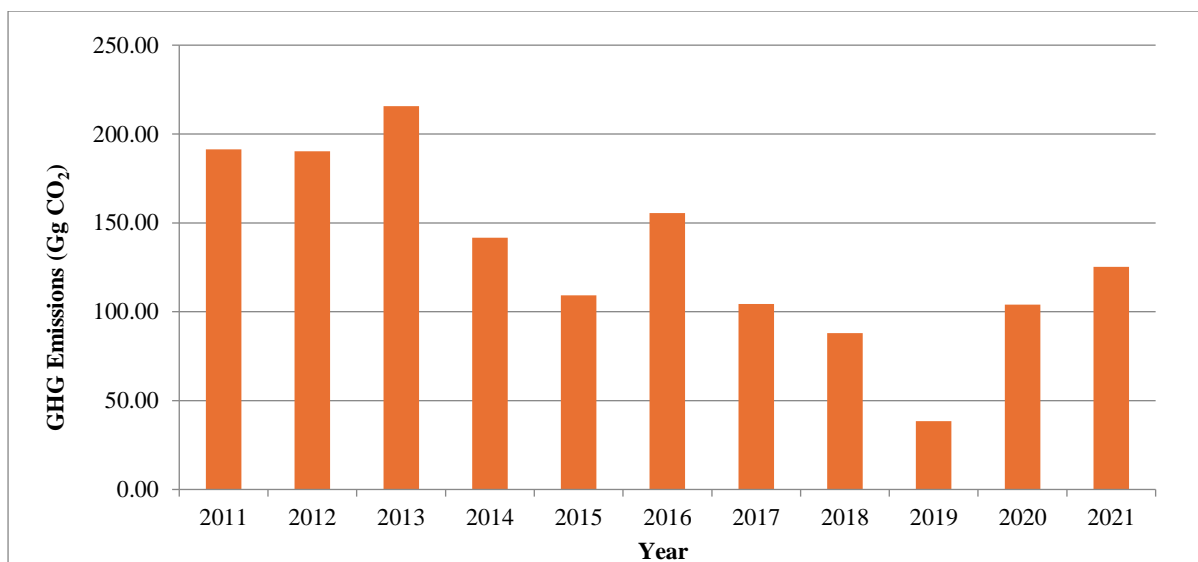


Figure 1.10: CO₂ emissions from lime production

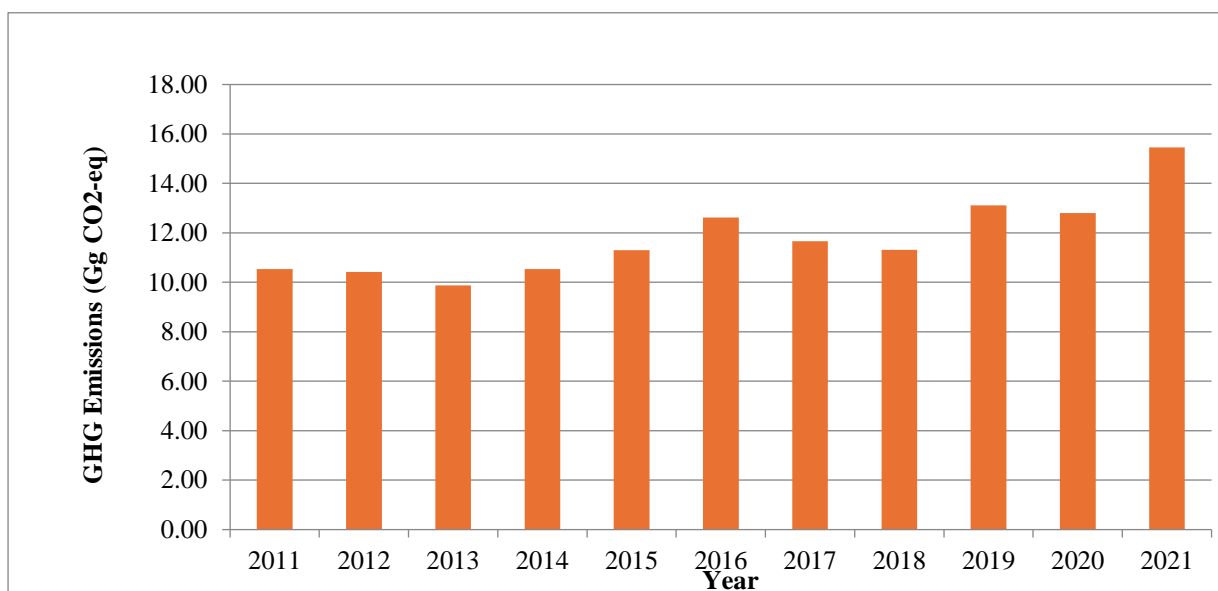


Figure 1.11: GHG emissions from the glass industry

D) Ceramic industry

Calcite and dolomite, which are carbonate, are the raw materials used in the ceramic industry. When burnt, they emit CO₂. The data on dolomite and calcite consumption were obtained directly from the ceramics industry which comprises few companies. Data was not available in few small companies, but it will not significantly affect the final estimation since their consumption is negligible. For some of the companies' data were not available for the year 2013, 2012 and 2011. Therefore, those data were estimated based on the rest of the year data for completeness. The emission factors for calcite and dolomite are 0.440 tCO₂/tonne of Calcite and 0.477 tCO₂/tonne of dolomite respectively. The CO₂ emissions released during the combustion of both calcite and dolomite in the ceramic industry are shown in Annex 12.

Figure 1.12 shows the CO₂ emissions from the ceramic industry.

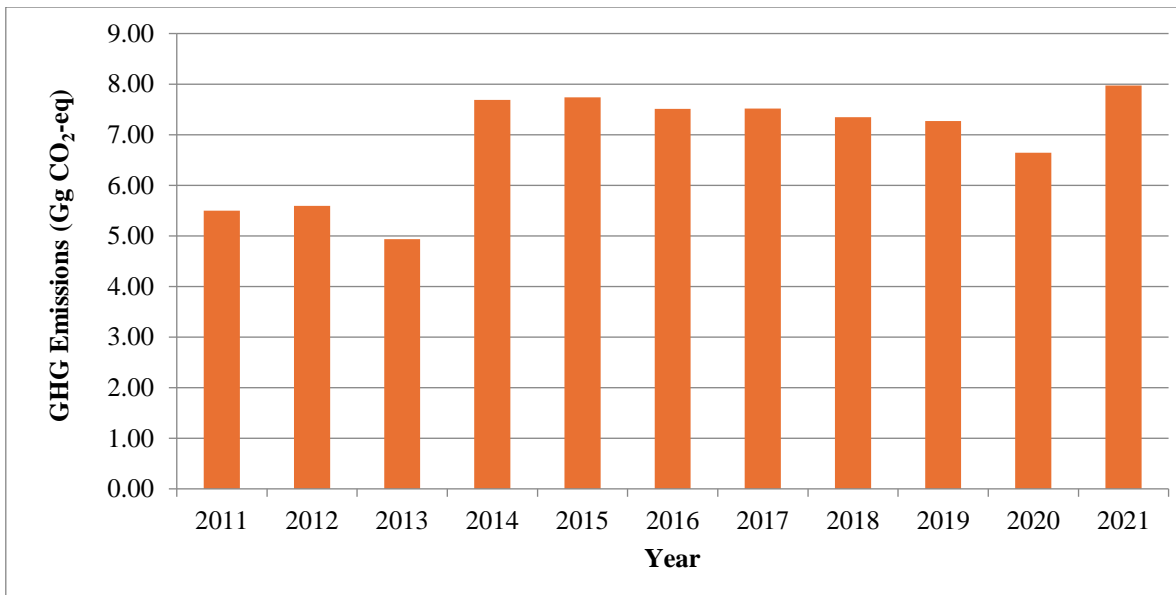


Figure 1.12: CO₂ emissions from the Ceramic industry

E) Chemical industry

There is no any major chemical industry (2B) in Sri Lanka which manufactures products defined in 2B1 to 2B10 in IPCC-2006. Hence, emissions from this category were considered as not occurring.

F) Metal industry

Sri Lanka does not have any metal industry which produced metals from ore but there are several metal rolling industries operating with imported raw material and scraps. However, NMVOC released from these industries are below 0.01 Gg and hence not reported.

G) Solvent application

Solvents are used for a variety of purposes including their use as a cleaning agent and in manufacturing surface coatings. Solvent used as Ozone Depleting Substances (ODS) is reported with the Montreal protocol and therefore solvent used for other than ODS is reported here. Data for general purposes solvents were obtained from the database of SLSEA. The emission factor was obtained from EMEP CORINAIR documents B621. The emissions of NMVOC generated from solvent application are given in Annex 13.

H) Food and beverage industry

a) Bakery industry

NMVOCs are emitted during bakery product production, particularly bread. The annual bread production was estimated using household consumption data, which averages 43.2 kg per household per year, as noted in Table A6 of the *Statistical Pocketbook 2024* by Sri Lanka's Department of Census and Statistics. The data originates from the Household Income and Expenditure Surveys of 2012/13, 2016, and 2019. NMVOC emissions were calculated using an emission factor of 4.5 kg per tonne of bread (EMEP CORINAIR B465). The resulting emission estimates are detailed in Annex 14.

The emissions trends are illustrated in Figure 1.13.

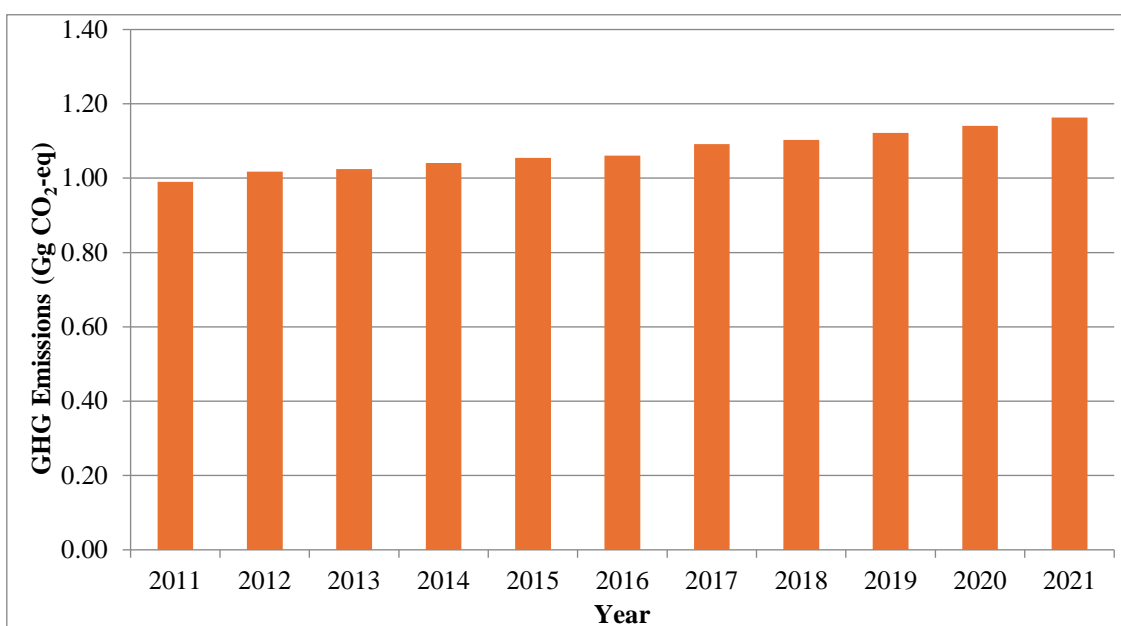


Figure 1.13: NMVOC emissions from Bread production

b) Spirit manufacturing industry

NMVOCs are released during the production of spirits as well as during production of liquor from coconut, Palmyra toddy and sugar cane molasses. Data on the production of spirits were obtained from the Excise Department of Sri Lanka. The emission estimates are given in Annex 15 and the emission factor is 150 kg/kl.

Figure 1.14 shows the NMVOC emissions from the spirit manufacturing industry.

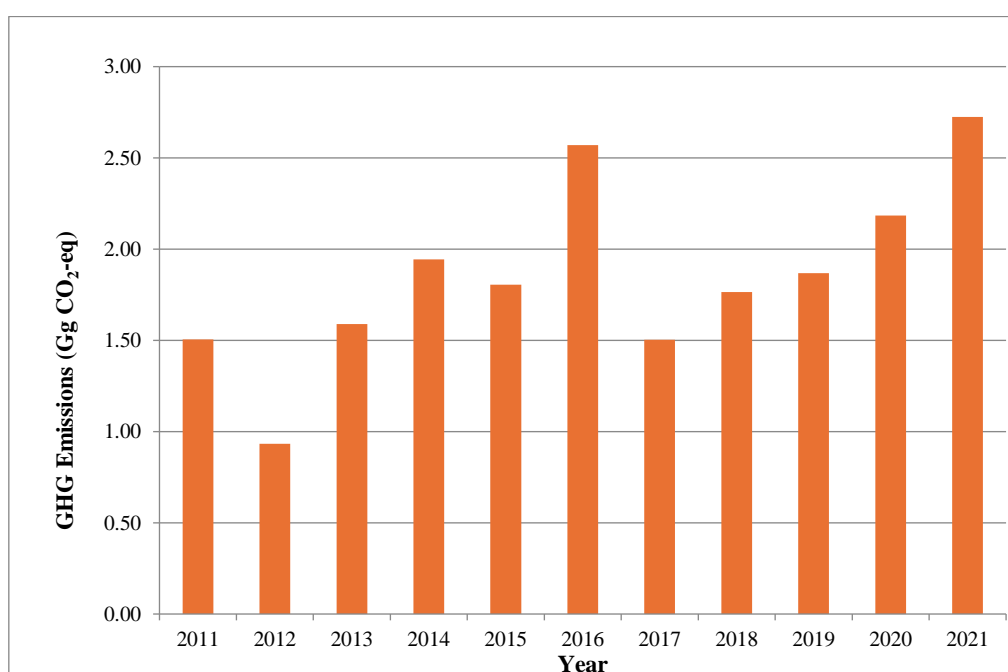


Figure 1.14: NMVOC Emissions from Spirit production

1.3.3.4 Consumption of fluorinated compounds

Among the fluorinated compounds, HFC compounds are used as substitutes in the refrigeration and air-conditioning industry, foam blowing industry, aerosol manufacture and as a suppressant. Hydrofluorocarbon compounds are imported into Sri Lanka through refrigerators and air-conditioners, and in the form of cylinders to service and replenish HFCs in refrigerators and air-conditioners, particularly in motor vehicle air-conditioners. Sri Lanka reports emission of these HFCs with the Montreal Protocol reporting and therefore it is not reported here.

1.3.3.5 Summary: IPPU sector GHG emissions

The consolidated GHG inventory for the IPPU sector for 2021 is given in Annex 16. It comprises CO₂ emissions from cement industry, lime industry, glass industry, ceramics industry and NMVOCs emissions from breads production and spirits production.

Table 1.3 and Figure 1.15 show the trend of the total CO₂ emission from the IPPU sector of Sri Lanka.

Table 1.3: Annual CO₂ emissions of the IPPU sector

Code	2	2A1	2A2	2A3	2A4	
GHG Category	IPPU Sector	Cement Production	Lime Production	Glass Production	Ceramic Production	
CO ₂ Emission (Gg)	2011	544.29	336.96	191.29	10.54	5.5
	2012	573.41	367.15	190.24	10.42	5.6
	2013	593.57	363.02	215.74	9.87	4.94
	2014	532.3	372.47	141.59	10.54	7.69
	2015	496.42	368.14	109.24	11.3	7.74
	2016	553.42	377.83	155.46	12.62	7.51
	2017	490.67	367.21	104.28	11.67	7.52
	2018	472.46	365.76	88.04	11.31	7.35
	2019	429.71	370.88	38.45	13.12	7.27
	2020	486.7	363.29	103.97	12.8	6.64
	2021	519.29	370.64	125.23	15.45	7.97

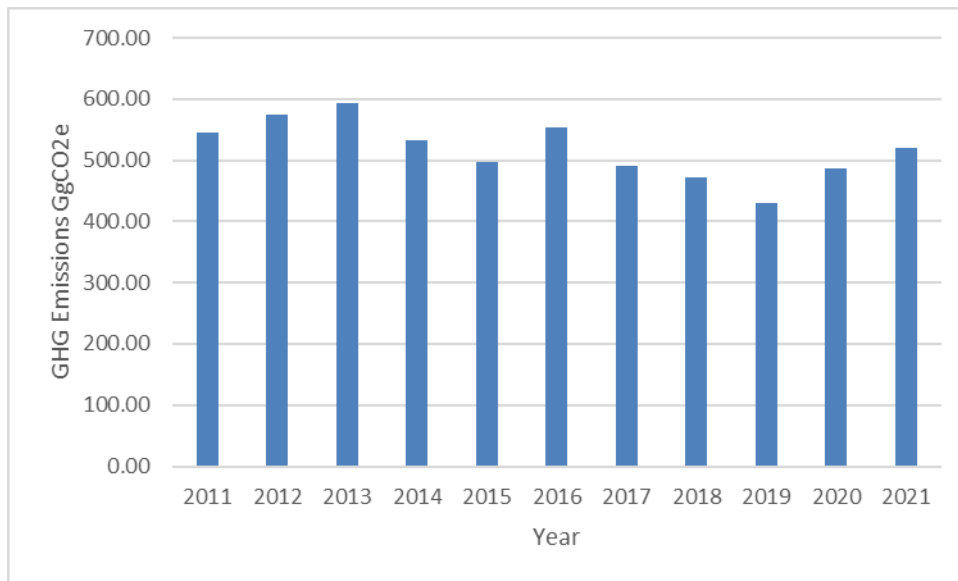


Figure 1.15: CO₂ emissions from the IPPU sector

1.3.4 Agriculture

Agriculture plays a pivotal role in Sri Lanka's economy, contributing significantly to employment, food security, and rural development. However, the sector is also a major source of GHG emissions, primarily from rice cultivation, livestock, and the use of synthetic fertilizers. Addressing these emissions is crucial for Sri Lanka to meet its climate commitments under the Paris Agreement. Between year 2000 and 2021, CH₄ emissions increased by 23% in Agriculture sector due to livestock emission and crop land emission. CO₂ emission increased by 16% due to urea fertilizer application in crop lands from 2011 to 2021.

In line with the Paris Agreement, this report outlines the mitigation measures implemented in the agricultural sector to reduce GHG emissions.

1.3.4.1 Description of GHG emissions and removals: Agriculture sector

Sri Lanka's agricultural mitigation strategy emphasizes adopting climate-smart agricultural practices, enhancing livestock management, and promoting organic farming. These efforts are guided by national policies and supported by international collaboration to achieve sustainable development goals while strengthening the sector's resilience to climate change.

The inventory covers the period from year 2011 to the year 2021, offering insights into the trends and sources of GHG emissions in Sri Lanka.

1.3.4.2 Methodologies

Sri Lanka's approach to estimating GHG emissions and removals aligns with the IPCC-2006, ensuring international consistency. This flexibility enables the inventory to better reflect the nation's unique emissions and removals profile, especially in areas where default methods may lack precision. Currently, Tier 1 emission factors (EFs) based on IPCC default values are used, which suit contexts with limited data. However, the development of country-specific EFs based on local measurements or research could improve accuracy and provide a nuanced

understanding of emission dynamics, supporting targeted mitigation strategies and policy alignment with climate commitments.

Agriculture is a significant contributor to Sri Lanka's GHG emissions, particularly through CH₄ and N₂O. CH₄ emissions arise predominantly from enteric fermentation in livestock, where cattle and ruminants release CH₄ during digestion, and from rice cultivation, as flooded paddy fields create anaerobic conditions conducive to CH₄ production. N₂O emissions occur from manure management, where stored or treated manure emits N₂O and CH₄ emissions from agricultural soils, driven by nitrogen-based fertilizers and microbial processes like nitrification and denitrification, underscore the need for targeted mitigation in agriculture. Adopting climate-smart practices can effectively reduce the sector's GHG footprint.

Furthermore, field burning of agricultural residues, such as crop waste, produces CO₂, NO_x CH₄ and N₂O, adding to the GHG emissions profile. Additionally, CO₂ emissions arise from the application of soil amendments like limestone and urea, which are used to enhance soil fertility but release CO₂ as a byproduct. Accurately estimating these emissions is crucial for Sri Lanka's GHG inventory, as it enables the country to identify emission hotspots and develop effective mitigation strategies within the agriculture sector.

1.3.4.3 Trends in GHG emissions in the Agriculture sector

Figure 1.16 shows the trend in GHG emissions from various agricultural activities between 2011 and 2021, measured in gigagrams (Gg) of CO₂ equivalent (AgStat ,2021).

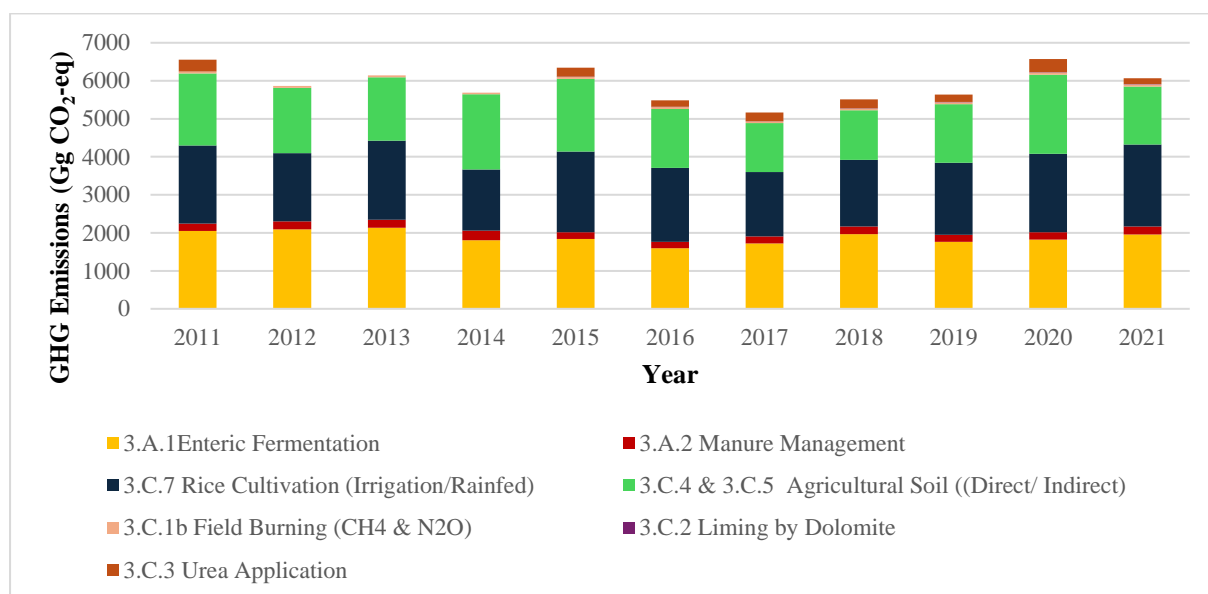


Figure 1.16: GHG emissions from various agricultural activities

As depicted, the overall trend in GHG emissions from different source categories can be described as follows.

3. A.1 Enteric fermentation: refers to CH₄ emissions from the digestive systems of livestock, particularly ruminants like cows. It appears to have a relatively stable trend over the years, with minor fluctuations around 1800 Gg CO₂-eq, making it one of the largest contributors.

3. A.2 Manure management: represents emissions from manure storage and treatment. Its contribution is relatively low compared to other sources, with values below 200 Gg CO₂-eq, and remains stable throughout the years.

3. C.7 Rice cultivation: is a significant contributor to GHG emissions due to methane emissions from flooded rice paddies. It fluctuates between 1600 and 2200 Gg CO₂-eq, showing some variability but remaining one of the larger sources of emissions.

3. C.4 Agricultural soil - direct emission: N₂O direct considered due to synthetic fertilizers, manure management, crop removal and biological fixation. This contributes a larger amount of emission compared to indirect emissions (FAO, 2024).

3. C.5 Agricultural soil indirect emission: N₂O indirect emission was considered due to leaching, volatilization, and atmospheric deposition (FAO, 2024). Direct and Indirect emission in Mt CO₂eq significantly contributes to the GHG emission. Direct emission is about four times higher than the indirect emission.

3. C.1b Field burning: includes emissions from the burning of crop residues on fields. Field burning contribute about 50 Gg CO₂-eq during 2011-2021. The trend is stable, with low values under 100 Gg CO₂-eq. (Somaratna and Lokupitiya, 2023).

3. C.2 Liming: Emissions were considered due to dolomite application. It contributes with low value less than 50 Gg CO₂-eq.

3. C.3 Urea application: Emissions from the application of urea fertilizers. This category also shows low levels of GHG emissions, remaining with slightly increasing trend below 400 Gg CO₂-eq.

In summary, enteric fermentation, Direct and indirect emission of agricultural soil and rice cultivation are larger sources contribution of GHG emissions in the agricultural sector, with relatively stable trends over time. Other categories contribute significantly less to the overall emissions and show minimal change throughout the period.

1.3.4.4 Summary: Agriculture sector GHG emissions

The summary of GHG emissions from the agriculture sector is given in Table 1.4.

Table 1.4: Trend in GHG emissions from various agricultural activities

Sub Sector	3A1 Enteric Fermentation	3A20 Manure Management	3C7 Rice Cultivation (Irrigation/ Rainfed)	3C4& 3C5 Agricultural Soil ((Direct/ Indirect)	3C1b Field Burning (CH ₄ & N ₂ O)	3C2 Liming by Dolomite	3C3 Urea Application
2011	2047.08	199.5	2052.4	1892.8	54.5	NA	308.31
2012	2094.9	204.33	1797.5	1720.77	47.69	NA	NA
2013	2130.5	212.24	2077.68	1667.85	54.9	NA	NA
2014	1804.88	256.48	1600.87	1983.52	43.17	NA	NA
2015	1835.4	179.48	2126.89	1904.4	56.06	6.26	235.44
2016	1596.84	166.88	1944.01	1551.74	51.05	5.31	172.93
2017	1720.04	182.56	1697.62	1290.8	44.47	5.83	222.27
2018	1964.48	205.52	1749.27	1303.27	46.57	4.42	233.14
2019	1759.24	188.16	1895.86	1544.84	49.97	3.71	199.36
2020	1820.84	196.84	2059.67	2086.07	54.07	5.28	351.73
2021	1957.15	209.73	2160.25	1523.94	57.15	3.62	158.26

1.3.5 LULUCF

1.3.5.1 Overview

Sri Lanka has a rich land use history spanning over two millennia, characterized by a sophisticated hydraulic civilization that demonstrated advanced understanding of sustainable land and forest management. The country's total land area encompasses diverse land use patterns shaped by its tropical climate, varied topography, and historical development patterns. The natural forest cover has decreased dramatically from 84% in 1881 to 29.2% in 2015, while the population increased from 2.5 million to 21 million during this period. The country has traditionally been divided into three climatic zones: wet zone in the Southwestern region including central hill country, dry zone covering predominantly Northern and Eastern parts, and intermediate zone skirting the central hills except in South and West. These zones are further subdivided into 46 agro-ecological regions based on rainfall, distribution and other parameters.

The LULUCF sector in Sri Lanka is particularly significant due to its dual role in climate change mitigation and adaptation, as well as its importance for biodiversity conservation - Sri Lanka being recognized as one of 36 global biodiversity hotspots. The sector faces multiple challenges including deforestation pressures, land degradation, and increasing vulnerability to climate change impacts such as droughts, floods, and landslides.

Methodology used: The preparation of the GHG Inventory followed a comprehensive and systematic methodology aligned with international standards and national data resources. The inventory was developed using the IPCC 2006/2019 Refinement Tier-1 methodology with default emission factors, as concerns existed regarding the reliability and precision of some nationally available emission factors. GWPs from the AR5, based on a 100-year time horizon were applied for the calculations. The inventory prioritized the use of nationally available

published activity data, sourcing information from key government institutions including the Department of Forest Conservation, Department of Wildlife Conservation, Department of Census and Statistics, Mahaweli Authority of Sri Lanka, and the Ministry of Plantation Industries. To enhance the robustness of the inventory, both key category analysis and uncertainty analysis were conducted alongside the GHG inventory calculations. The final content underwent validation through a stakeholder consultation process, involving key sector representatives to ensure accuracy and completeness of the inventory.

1.3.5.2 Institutional arrangements

The institutional framework for the LULUCF sector involves multiple government authorities managing different land use categories. Two state agencies are primarily vested with forest conservation: the Department of Forest Conservation, which manages approximately 29.2% of the country's land area including various forest ecosystems and about 90,000 hectares of forest plantations, and the Department of Wildlife Conservation, which manages approximately 14% of the total land area. Both departments' jurisdictions include forests (including mangroves) as well as wetlands and grasslands within their protected areas. However, wetlands and grasslands outside these protected areas do not fall under any specific agency mandated for their conservation. The State Timber Corporation (STC) in Sri Lanka plays a crucial role in the timber industry by managing the sustainable harvesting, processing, and distribution of timber and timber-based products, thereby contributing significantly to the national economy, and ensuring environmental sustainability. The Ministry of Plantation Industries oversees croplands including tea, rubber, coconut, and oil palm plantations, though these are predominantly privately owned. The forests which are located in the areas under the Mahaweli Authority of Sri Lanka are managed by them. While several agencies include homegardens in their programs, no specific agency has direct jurisdiction over them, and they remain privately owned. Trees in urban and municipal areas fall under the Urban Development Authority or municipalities, while those in other areas are managed by local authorities.

The Ministry of Environment, as the focal point for the UNFCCC, coordinates climate change-related activities across these institutions. The Climate Change Secretariat, established under the Ministry, facilitates the implementation of climate change policies and strategies relevant to the LULUCF sector. The National Climate Change Policy of Sri Lanka provides specific guidance for the sector, emphasizing the need to enhance carbon sinks while ensuring sustainable land management practices.

1.3.5.3 Trends in GHG emissions and removals in the LULUCF sector (2011-2021)

The data were obtained from official sources such as the Department of Forest Conservation, State Timber Corporation, Ministry of Plantation Industries, Department of Census and Statistics, and the Land Use and Policy Planning Department etc. The data highlights biomass gains, losses, and net changes in carbon stocks across Sri Lanka's key land-use categories forests, croplands, grasslands, wetlands, and settlements spanning from 2011 to 2021. The LULUCF sector demonstrated significant carbon sink capacity, with total net removals reaching -9855.17 Gg CO₂-eq in 2021. Cropland emerged as the dominant sink component, contributing approximately 67% of total sector removals with -6,424.42 Gg CO₂-eq in 2021, primarily from cropland remaining cropland (-6,074.46 Gg CO₂). Forest lands, accounting for

about 28% of sector removals (-2,731.15 Gg CO₂), maintained substantial carbon sequestration despite experiencing losses from wood removal (196.34 Gg CO₂) and forest fires (50.97 Gg CO₂) in 2021.

Wetlands, grasslands, and settlements showed smaller but consistent removal patterns. Wetlands contributed -492.42 Gg CO₂ in 2021, though experiencing notable methane emissions (37.75 Gg CO₂-eq). Grassland removals were modest at -13.83 Gg CO₂, with minimal non-CO₂ emissions (0.02 Gg CH₄, 0.001 Gg N₂O). Settlements, primarily through tree cover, maintained stable removals at -29.75 Gg CO₂ in 2021, with no reported non-CO₂ emissions. These trends reflect the varied contributions of different land-use categories to Sri Lanka's carbon sink capacity, with croplands and forests playing particularly crucial roles in the national GHG inventory. The relevant values are tabulated in Annex 17 and is shown in Figure 1.17.

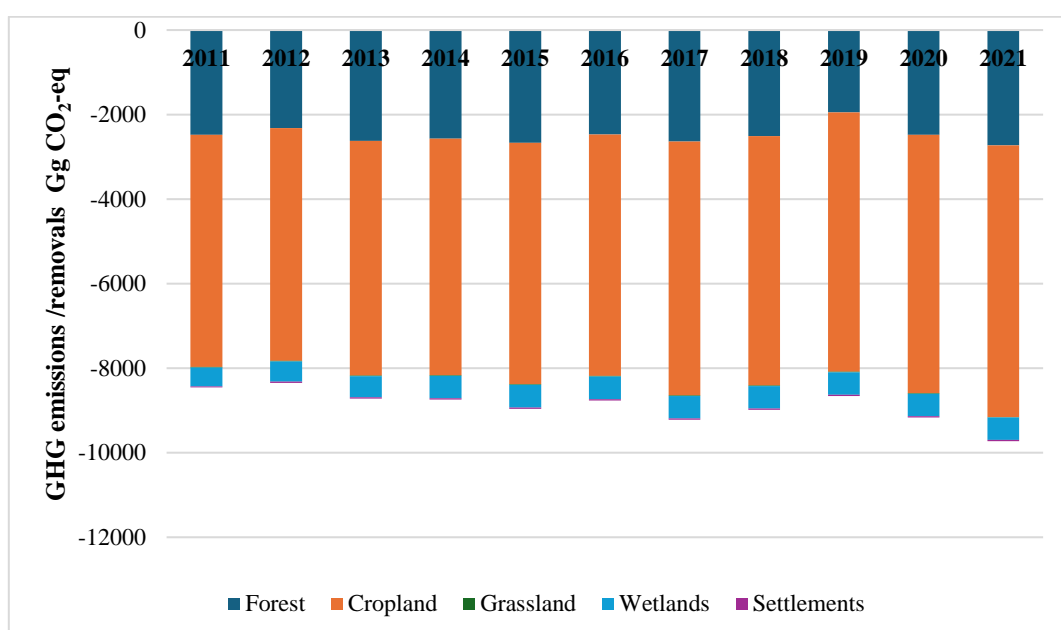


Figure 1.17: GHG emissions/removals in the LULUCF sector (2011-2021)

A) Emission and removal trends by gas

The LULUCF sector in Sri Lanka acted as a significant net carbon sink in 2021, with total net removals of -9,855.17 Gg CO₂-eq. The sector's GHG profile shows that CO₂ was the dominant gas with net removals of -9,757.86 Gg CO₂-eq from forest land (-2,809.37 17 Gg CO₂-eq), cropland (-6,210.18 17 Gg CO₂-eq), wetlands (-529.42 Gg CO₂-eq), grassland (-13.34 17 Gg CO₂-eq) and trees in settlements (-29.75 17 Gg CO₂-eq). CH₄ emissions contributed (38.52 17 Gg CO₂-eq), with wetlands being the largest source (37.75 17 Gg CO₂-eq) from wetlands remaining wetlands), Nitrous oxide (N₂O) emissions amounted to 0.534 Gg CO₂-eq, mainly from cropland (0.48 Gg CO₂-eq) and forest land (0.044 Gg CO₂-eq). Non-CO₂ greenhouse gases including NO_x (0.25 Gg), CO (8.51 Gg), and NMVOC (0.35 Gg) were also emitted.

1.3.5.4 Key category analysis

The key category analysis for the Forestry sector from 2011 to 2021 was conducted using both level and trend assessments following the IPCC-2006. At the level assessment, cropland

remaining cropland emerged as the most significant category, contributing approximately 63% to total sector removals with values reaching -6,074.46 Gg CO₂-eq in 2021. This substantial contribution is primarily attributed to perennial crop biomass accumulation, with living biomass gains of -6,210.18 in 2021. Forest land remaining forest land represented the second largest category, accounting for about 27% of sector removals with net removals of -2,562.06 Gg CO₂-eq in 2021, despite experiencing losses from wood removal (196.34 Gg CO₂-eq) and fire disturbances (50.97 Gg CO₂-eq). Wetlands formed the third key category, contributing through a combination of CO₂ removals (-529.42 Gg CO₂-eq) and CH₄ emissions (37.75 Gg CO₂-eq) in 2021. The details are tabulated in Annex 18.

1.3.5.5 Uncertainty analysis

The uncertainty analysis reveals varying levels of confidence across different categories and gases in the LULUCF sector. For CO₂ estimations, forest plantations show a combined uncertainty of $\pm 25\%$, comprising $\pm 20\%$ uncertainty in activity data (plantation area measurements) and $\pm 15\%$ in emission factors (biomass growth rates). Cropland demonstrates lower uncertainty levels with a combined uncertainty of $\pm 19\%$, derived from $\pm 15\%$ uncertainty in activity data (perennial crop areas) and $\pm 12\%$ in emission factors (biomass accumulation rates). Wetlands exhibit higher uncertainty with a combined value of $\pm 27\%$, reflecting $\pm 18\%$ uncertainty in area estimates and $\pm 20\%$ in carbon accumulation rates. Non-CO₂ gases show higher uncertainty levels, with CH₄ having a combined uncertainty of $\pm 36\%$ ($\pm 20\%$ in activity data, $\pm 30\%$ in emission factors) and N₂O showing $\pm 40\%$ combined uncertainty ($\pm 20\%$ in activity data, $\pm 35\%$ in emission factors). The uncertainty of Harvested Wood Products is $\pm 25\%$. The major sources of uncertainty include not using country-specific emission factors, incomplete historical data, variability in carbon stock changes, limited spatial resolution of land use data, and temporal variations in growth rates. The details are tabulated in Annex 19.

1.3.5.6 Summary: LULUCF sector GHG emissions and removals

The GHG summary of LULUCF sector is given in Table 1.5.

Table 1.5: The summary of the GHG emissions and removals in LULUCF sector (Gg CO₂-eq)

Year	Forestland	Cropland	Grassland	Wetlands	Settlements	HWP	Total
2011	-2478.88	-5488.90	-15.72	-445.52	-28.80	-176.8	-8634.62
2012	-2322.80	-5505.80	-15.53	-471.68	-28.98	-194.4	-8539.19
2013	-2626.12	-5550.8	-15.34	-498.33	-29.16	-180.2	-8899.95
2014	-2569.07	-5601.13	-15.15	-525.18	-29.25	-196.2	-8935.98
2015	-2667.33	-5710.59	-14.96	-537.06	-29.34	-176.0	-9135.28
2016	-2474.17	-5710.59	-14.78	-535.32	-29.43	-201.0	-8965.29
2017	-2639.87	-6003.39	-14.59	-533.79	-29.52	-190.4	-9176.46
2018	-2506.90	-5904.19	-14.40	-532.26	-29.61	-189.1	-8836.56
2019	-1946.47	-6135.07	-14.21	-530.71	-29.70	-180.4	-8836.56
2020	-2480.38	-6111.44	-14.02	-529.99	-29.70	-201.4	-9366.93
2021	-2731.15	-6424.42	-13.83	-529.42	-29.75	-163.6	-9892.17

1.3.6 Waste

1.3.6.1 Waste sector overview

The regulatory framework includes key measures directly supporting GHG emission reduction, particularly the gazette notification banning open burning of plastics (Gazette No. 2034/36). The National Policy on Waste Management (2019) promotes circular economy approaches and integrated waste management solutions that contribute to emission reductions. The policy clearly emphasizes that when establishing infrastructure facilities that needs a minimum continuous supply of waste, such facilities should balance minimum waste supply requirements against waste prevention strategies. The National Energy Policy and Strategies supports these initiatives by favourably considering waste-to-energy solutions. These are further complemented by the National Action Plan on Plastic Waste Management (2021-2030), which includes restrictions on thin polythene, single-use plastics, and polystyrene products that typically end up being burned or dumped.

Healthcare facilities and industrial sectors have implemented specific measures contributing to emission reductions through their waste management practices. Healthcare facilities follow strict waste segregation protocols, separating clinical waste, general waste, and recyclables as per national healthcare waste management guidelines, preventing improper disposal and associated emissions. In the industrial sector, many facilities implement resource recovery and preferred management options within the waste hierarchy, while recent recycling initiatives promote detailed sorting of recyclable materials at source, separating items like cardboard, glass, metal, and plastics.

Despite these efforts, Sri Lanka continues to face significant challenges in waste management. The lack of adequate final disposal facilities remains a critical issue, with some local authorities still relying on unmanaged dumping sites. Limited waste processing infrastructure, particularly for specialized waste streams, hampers proper treatment and resource recovery. Some waste management facilities operate below optimal capacity due to technical and operational constraints. Waste collection rates remain particularly low in Pradeshiya Sabhas, where the larger geographical areas and scattered populations pose service delivery challenges. Due to insufficient collection services and limited disposal options, residents in these areas often resort to open burning of waste. However, household organic waste management is less problematic in rural areas compared to urban areas due to the greater availability of space.

Beyond municipal solid waste, industries across Sri Lanka generate substantial quantities of industrial waste requiring specialized handling and disposal methods. Industries typically manage their waste through resource recovery and other preferred options within the waste hierarchy. While some industries transfer waste to local authorities or third-party contractors, or attempt to manage it at the source, there are concerns about improper disposal practices. Despite regulations, some industries resort to unsustainable methods such as open burning and dumping, particularly when faced with waste types that require specialized treatment or when proper disposal options are limited or costly.

The country operates wastewater treatment plants under the National Water Supply and Drainage Board, strategically located across six cities (Kataragama, Kurunegala, Hikkaduwa, Rathmalana, Ja-ela, and Kandy), four housing schemes (Mattegoda, Raddalugama, Hanthana, and Jayawadanagama), and four free trade zones (Biyagama, Sithawaka, Koggala, and

Modarawela). Further, wastewater from Dehiwala/ Mt.Lavinia and Kollonnawa areas is conveyed to the Colombo Municipal Council (CMC) collection system. Further, wastewater from Dehiwala/ Mt.Lavinia and Kollonnawa areas is conveyed to the Colombo Municipal Council(CMC) collection system. Additional effluent treatment plants are operated by the Board of Investment (BOI) located at the Export Processing Zones (EPZ) of Malwatta, Katunayake, Horana, Watupitiwala, Kandy and Bingiriya.

1.3.6.2 GHG Emissions and Removals in the Waste sector

In the waste sector, GHG emissions are estimated to be from four main sources of waste treatment and disposal as per the IPCC guidelines. These comprise solid waste disposal at managed and unmanaged sites, biological treatment of solid waste, waste incineration and open burning, and wastewater treatment and discharge. For biological treatment, the assessment includes only commercial-scale composting operations, as data for household composting practices are unavailable. While small-scale biogas plants operate in some places, these are also excluded from calculations due to their limited scale.

The incineration category reports healthcare waste incineration at a centralised facility. Incinerators at hospitals are excluded due to limited availability of data. In the industrial sector, waste incineration activities are not included in emissions calculations due to the lack of reliable and accessible data on operational parameters and waste volumes processed. Furthermore, thermal processes that generate energy, such as co-processing and waste-to-energy facilities, are accounted for in the Energy sector and not reported under the waste sector. Although open burning of waste remains mostly in rural areas, it is difficult to quantify each waste type separately due to lack of reliable data. Therefore, only the open burning of plastics waste is considered in the assessment. The wastewater treatment focuses on centralized treatment facilities for municipal wastewater treatment, while excluding individual systems such as latrines and other decentralized treatment facilities. These data gaps need to be addressed in future reporting. Figure 1.18 illustrates the waste sector emission categories.

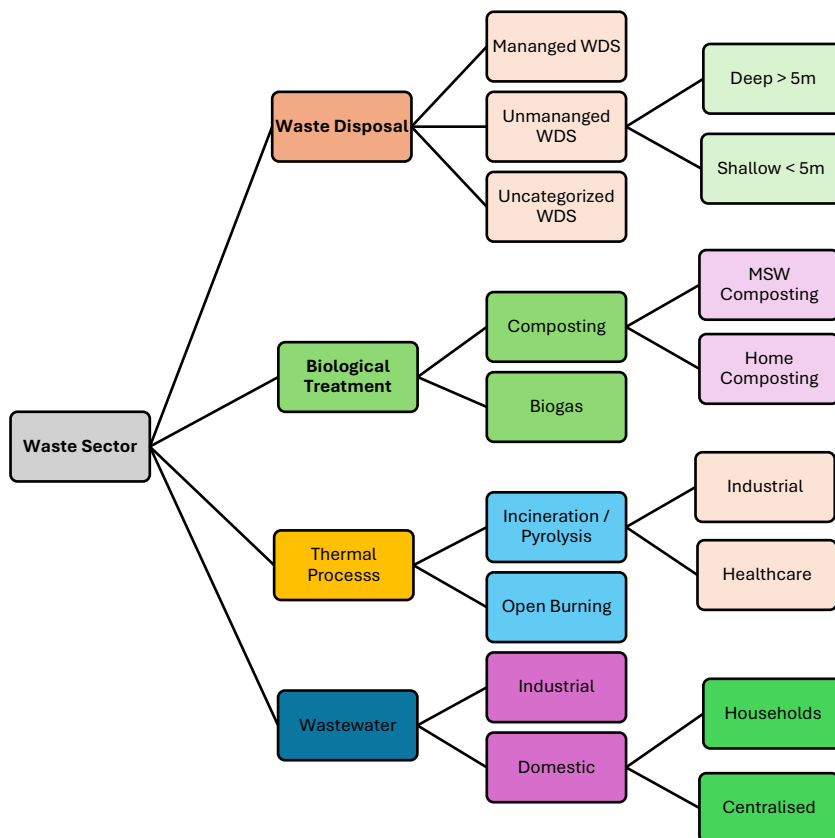


Figure 1.18: Waste Sector emission categories

1.3.6.3 Trends in GHG emissions and removals in the Waste sector

The waste sector GHG emissions exhibited an upward trajectory during the period 2011-2021, with total emissions increasing from 596.0 to 657.9 Gg CO₂-eq based on the available data (Table 1.5). This increase aligns with growing waste generation driven by population growth and urbanization. However, these figures underestimate the actual emissions from the waste sector, as they do not capture all emission sources due to known data limitations and gaps. A comprehensive accounting of all waste-related emissions, including those from undocumented waste management activities, would reveal higher GHG contributions from this sector. Looking at specific categories, waste disposal shows the most substantial increase throughout the decade, rising from 379.3 to 473.7 Gg CO₂-eq. This constant growth likely reflects increasing population and consumption patterns and due to increased waste collection. Biological treatment emissions also demonstrated a gradual increase, though on a smaller scale, moving from 40.6 to 45.8 Gg CO₂-eq over the decade. The incineration and open burning category saw a decrease from 165.4 Gg in 2011 to 96.0 in 2013. This initial decrease might reflect improved waste management practices and stricter regulations on open burning. Wastewater treatment emissions followed a stepwise increase over the years. Notable jumps occurred in 2014 (from 13.8 to 21.0) and 2020 (from 24.4 to 30.4). These sudden increases are related to expansions in wastewater treatment infrastructure. Figure 1.19 shows the trends in GHG emissions from waste management activities by category.

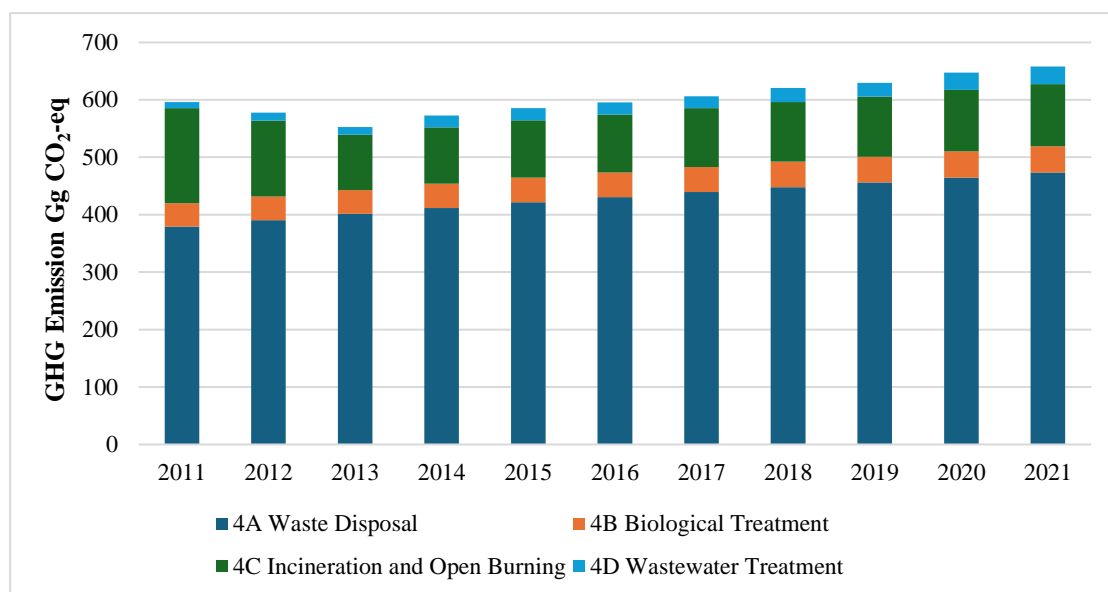


Figure 1.19: GHG emissions and removals in the Waste sector

1.3.6.4 Summary: Waste sector GHG emissions

The summary of GHG emissions in the waste sector is given in Table 1.6.

Table 1.6: Trends in GHG Emissions from Waste Management Activities by Category

GHGs	GHG emission (Gg CO ₂ -eq)										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
4A Waste Disposal	379.3	390.7	401.6	411.9	421.9	430.6	439.4	447.9	456.3	464.6	473.7
4B Biological Treatment	40.6	41.0	41.5	42.1	42.5	43.1	43.6	44.3	44.6	45.6	45.8
4C Incineration and Open Burning	165.4	132.3	96.0	97.9	100.0	100.8	102.3	103.8	104.5	107.1	108.0
4D Wastewater Treatment	10.7	13.8	13.8	21.0	21.0	21.0	21.0	24.4	24.4	30.4	30.4
Total	596.0	577.8	552.8	572.9	585.4	595.5	606.3	620.4	629.8	647.7	657.9

CHAPTER 2

Information necessary to track progress made in implementing and achieving Nationally Determined Contributions

Chapter 2

Information necessary to track progress made in implementing and achieving Nationally Determined Contributions

2.0 Overview

The chapter explains how Sri Lanka tracks its progress for the period of 2021-2023 in implementing and achieving its NDCs submitted in 2021, including the monitoring and reporting systems established. Further, the national circumstances including the geographic, population, climate and economic profiles, institutional and coordination mechanisms between relevant stakeholders are described to ensure effective climate actions and the ongoing efforts to align its climate strategies with international climate commitments while fostering sustainable development.

2.1 National circumstances and institutional arrangements

2.1.1 Government structure

The Government of Sri Lanka (GoSL) established an Inter-agency National Steering Committee (NSC), which is chaired by the Secretary of the MoE, to oversee the implementation of NDCs. Members of the NSC represent the secretaries of line ministries in charge of the NDCs sectors. Further, the Ministry of Finance, the Department of National Planning, the Department of Fiscal Policy and the National Sustainable Development Council are also represented in the NSC. The NSC is the primary authority responsible for reviewing progress of NDCs implementation. To further encourage policy consistency at the highest level, the NSC also reduces duplication of effort, offers practical solutions to implementation barriers, and tracks overall progress in comparison to timelines.

Further, each NDC sector has its own Planning and Monitoring Committee (PMC) established under the approval of the Cabinet of Ministers. Each sectoral PMC is chaired by the secretary of the ministry responsible for the subject. The members of these PMCs are the heads of departments and institutions relevant to the NDC sectors. The PMC is established to ensure that the sectoral development plans fully align with the NDC implementation and monitoring plan.

The sectoral PMC must also monitor implementation delays to ensure that safeguards are in place for climate initiatives. The technical, budgetary and capacity requirements for NDC implementation are carefully examined by each PMC. The sectoral progress and the implementation requirements are reported to the NSC by the Chair of the PMC.

The CCS, a specialized division within the MoE, plays an overall coordination role between NSC and the PMC to ensure effective implementation of NDCs within the national framework.

2.1.2 Population Profile

The population of Sri Lanka is approximately 22 million, with a gender ratio of about 51.5% female and 48.5% male in 2022. The average population density is 354 per km². The population growth rate is at 0.11% in 2022 (DCS, 2023). However, the average population density is varied

due to rapid urbanization and industrialization in vicinities across the country. For instance, Western Province has a population density of 1,688 persons per km². Colombo being the commercial capital of Sri Lanka, has a population density of 3,547 persons per km². The Colombo Municipal Council alone has a population density of 19,158 persons per km² (The Chief Secretary's Office of Western Province, 2021). The dependency ratio in 2022 was 49.5% (DCS, 2023).

2.1.3 Geographic profile

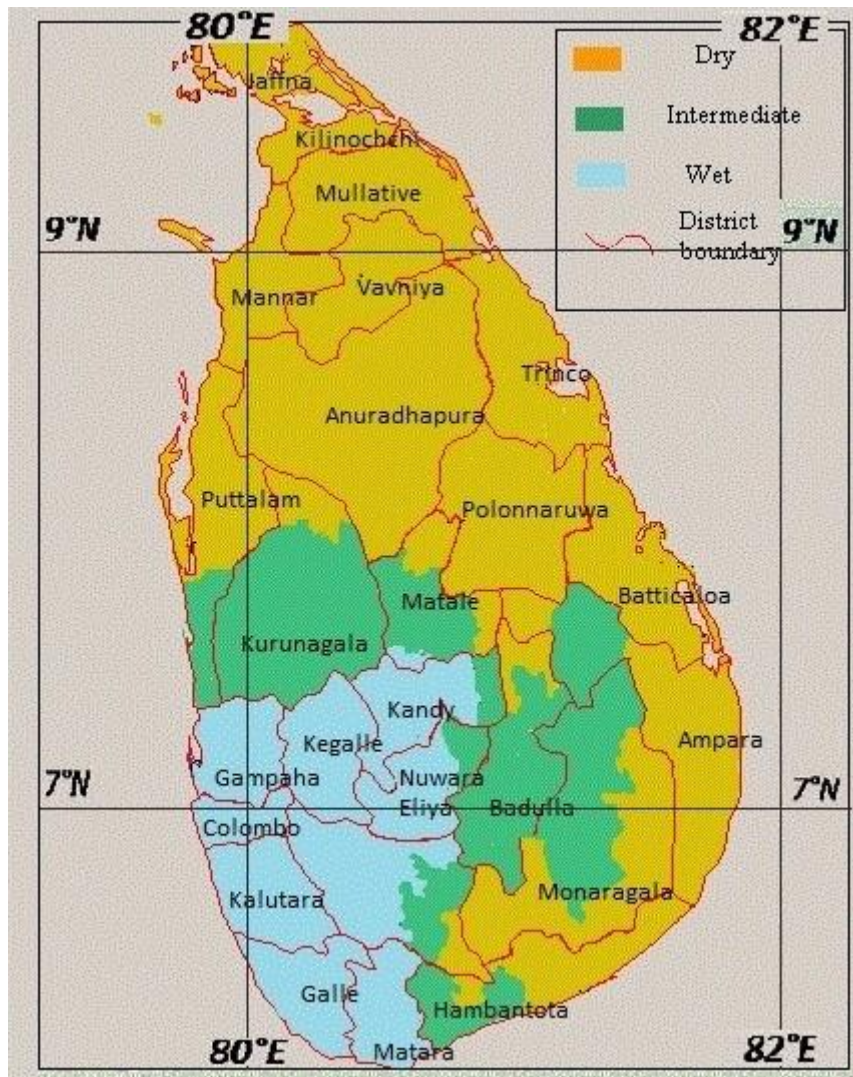
When considering the geographic profile of Sri Lanka, the topography is defined by three distinct features: the mountainous central highlands, expansive lowland plains and a coastal fringe. The central highlands, consisting of mountain ranges, plateaus and peaks are the origin of the island's radial river system. About 75% of the land lies below 300 meters in elevation, while the central highlands rise significantly. The lowland plains, which extend from the central highlands, exhibit diverse terrains, flat in the north and east but rugged in the southwest. The coastal fringe, characterized by sandy beaches, remains below 30 meters in elevation, offering varied coastal landforms. Sri Lanka has a coastline of approximately 1,620 km including the shoreline of bays and inlets excluding lagoons (CC&CRMD, 2024). There are about 103 distinct river basins covering 90% of the island.

2.1.4 Climate profile

Sri Lanka experiences a diverse climate influenced by the monsoon winds from the Indian Ocean and Bay of Bengal. The country experiences two distinct monsoons, one of which is the south-west monsoon, which occurs from May to September and brings heavy rainfall to the windward Central Highlands slopes. The north-east monsoon delivers considerable amount of rain to the north-east slopes from December to February. Water availability and agricultural productivity are influenced by the seasonal rainfall and temperature fluctuations that result from these monsoons.

Humidity is generally high along the coastal areas, while the interior regions experience moderate humidity. Average temperatures typically range from 25°C to 30°C, with cooler conditions in the central highlands due to elevation. This climatic diversity supports ecosystems such as rainforests, dry forests, wetlands and coastal zones, each hosting unique flora and fauna.

Sri Lanka's climate divides into three primary zones such as Wet, Dry and Intermediate. However, this climate profile faces growing threats due to climate change. Rising temperatures, altered precipitation patterns and frequent extreme weather events pose challenges to agriculture, water resources and biodiversity. These impacts necessitate understanding climate dynamics and developing adaptation strategies to build resilience in vulnerable communities and sectors. Figure 2.1 depicts the climate zones of Sri Lanka.



Source: Karunaweera et al., 2014

Figure 2.1: Climate Zones of Sri Lanka

2.1.5 Economic profile

The economy in Sri Lanka is dominated by the service sector (60% of GDP), followed by industry (25.6%) and agriculture (8.3%) (CBSL, 2022). Sri Lanka's GDP has faced significant challenges, contracting by 7.8% in 2022 and a further 7.9% in the first half of 2023 (World Bank, 2023). Key sectors such as construction, manufacturing and real estate experienced severe disruptions, exacerbated by shrinking credit, supply chain issues and inflation peaking at 69.8% in September 2022. Inflation eased to 4% by August 2023, stabilizing the economy and offering relief to households. Despite a projected GDP contraction of -2.3% for 2023, the fourth quarter saw a slight rebound of 4.5% year-on-year.

These issues, which were exacerbated by the COVID-19 pandemic, led to a sharp rise in both domestic and foreign debt. At present, Sri Lanka is recovering from this state. The rising poverty remain key challenges amidst of increasing climate risk and vulnerabilities, highlighting the need for urgent actions to stabilize inflation, reduce deficits and promote exports.

Sri Lanka's consistent trade deficit and dwindling foreign exchange reserves severely limits its ability to manage short-term debt and import needs. Efforts to mitigate trade deficits included boosting foreign exchange reserves through the tourism sector. Noting that tourism is a climate-sensitive sector, rising exposure to climate risks may have further repercussions to Sri Lanka's economy.

Sri Lanka's climate debt risk is also notable, with the Climate Debt Risk Index projected to reach 74.17 by 2030, and loans constituting the majority of its climate finance (\$1.44 billion), highlighting a dependency on loan-based funding (Change Initiative Limited, 2024).

2.1.6 Description of the Sectors

2.1.6.1 Electricity (Power) sector

The Electricity (Power) sector in Sri Lanka was dominated by major hydro (95%) in the early 1990s. Due to the expansion of electrification and changes in living standards, petroleum share was gradually increased to power up newly Introduced Thermal Power Plants (IPPs). Feed in tariff for Non-Conventional Renewable Energy systems (NCRs) introduced in early 2000, grid connection of first coal power plant and introduction of grid tie rooftop solar PV scheme (under net metering, net accounting & net plus) changed the share and shape of national power profile.

Sri Lanka has achieved nearly 100% electrification by now for all potential users of the country barring a few isolated communities. The total installed power generation capacity in 2021 was 4,813 MW, of which around 56% consists of renewable energy including large and small hydro, wind, solar and biomass. The gross electricity generation of the country was 17,947.7 GWh in 2021 and gross energy generation mainly consisted of 6,110.9 GWh of coal power, 5,658.5 GWh of major hydro power, 2,716.2 GWh of thermal oil power, 2540 GWh of new renewable energy and rest from the Ceylon Electricity Board (CEB) own wind power plant (Mannar) and micro power plants. In terms of the energy demand side, the main sectors include Industry, Household, Commercial and others.

The National Energy Policy and Strategies prioritizes energy security, equity and sustainability through a balanced energy mix, including Liquefied Natural Gas (LNG), indigenous natural gas, efficient coal, large hydro, locally refined furnace oil and non-conventional renewables. Key strategies include Demand Side Management (DSM), reducing transmission and distribution losses and modernizing infrastructure to enhance efficiency and lower emissions. The policy targets carbon net zero by 2050, aligning with NDCs, prohibiting new coal power plants and transitioning fuel oil-based plants to natural gas.

Sri Lanka has pledged to achieve net zero carbon status by 2050 in their updated NDCs which were submitted to the UNFCCC in 2021. To achieve its carbon net zero 2050 goal, Sri Lanka's net zero strategic plan focuses on transitioning to renewable energy, enhancing energy efficiency and adopting sustainable transportation systems. The roadmap includes initiatives such as increasing the share of renewable, implementing reforestation programs and promoting electric mobility and carbon capture technologies.

The Key interventions envisaged for GHG emissions reduction up to the year 2030 are as follows:

- Development of hydro-power base to its maximum potential through new large and small hydro-power plants amounting to around 300 MW.
- Develop approximately 800 MW of wind power generation in Northern and North-Western coastal areas of the island.
- Develop approximately 2,000 MW of solar power capacity using different modalities such as solar rooftops, small scale and large solar PV power plants.
- Power generation through biomass and municipal solid waste will also be added with an expectation of a reasonable contribution to power generation.
- Facilitate the implementation of pilot-scale projects using new renewable energy sources that have not yet reached commercial maturity and other grid supporting infrastructures including behind the meter (BtM) and grid-scale energy storage solutions to assist more renewable energy integration.
- Pursue Pumped Storage Hydro Power Plant development to accommodate higher level of intermittent and weather-dependent renewable energy to the power generation system.
- Continue the loss reduction initiatives of the transmission and distribution network.
- Convert existing fuel oil-based combined cycle power plants to use natural gas and to develop new natural gas plants as an alternative to planned coal power plants (depending on infrastructure availability for natural gas).
- Implement DSM activities through a five-year national Energy Efficiency Improvement and Conservation (EEI&C) programme.
- Introduce policy supportive measures such as tax benefits, low-interest financing, etc. to expedite the implementation of renewable energy development and energy efficiency improvement programmes.
- Engage in viable carbon trading mechanisms to promote the shift towards clean energy sources.

2.1.6.2 Transport sector

The transport sector in Sri Lanka is a significant source of GHG emissions, driven by the country's reliance on fossil fuel-based transportation and increasing vehicle numbers. The sector is dominated by road transport, accounting for over 90% of total transport emissions, which includes private and commercial vehicles, public buses, two-wheelers and three-wheelers. Rail transport contributes a smaller share, while air and maritime transport are minimal in comparison, yet included in the overall emissions profile.

As urbanization accelerates, the demand for transport services grows, exacerbating congestion and emissions. In response, Sri Lanka is pursuing policies to reduce emissions in the transport sector, such as promoting electric vehicle (EV) adoption, enhancing public transportation and encouraging non-motorized transport options based on the draft National Transport Policy. The MoE coordinates emissions tracking and reporting with the Ministry of Transport (MOT) and other key agencies to ensure alignment with national and international climate goals. This includes the implementation of the vehicle emission testing program to monitor and reduce transport sector emissions. Key policies and mitigation measures such as highway

buffer zones and resource-efficient material use in road construction are also highlighted for their role in promoting sustainability and reducing environmental impact.

2.1.6.3 Industry sector

The industrial survey conducted in 2016 by the DCS reported 21,295 industrial establishments in Sri Lanka with manufacturing as the largest segment. Textile, apparel and tea manufacturing are the most significant export-oriented sub-sectors. Industrial production is the second-largest contributor to GDP at 27.5%, following the service sector at 60.5%. It also employs 25.5% of the country's workforce (CBSL, 2022).

The key industries contributing to GHG emissions are cement manufacture, lime production for the construction industry, glass industry and ceramic industry. However, compared to emissions from industrial energy consumption, industrial processes generate a relatively low level of GHG emissions.

In Sri Lanka, seven NDCs are defined for industry sector and for each NDC, several sub activities are identified totalling to 37 for all NDCs. To track the progress made in implementing and achieving NDCs for each activity a leading government institute is identified and assigned and data sources are identified. The Ministry of Industry (MOI) has been designated as the leading organization responsible for coordinating with identified lead institutions and data sources to collect data, track the progress of implementing NDCs in the industrial sector and report to the MoE. Following the Industrial Pollution Management Policy statement signed by the three ministers; (Environment, Industry and Science & Technology) in 1995, many activities have been initiated to integrate environmental concern into the industrial development sector. During the last two decades MOI introduced cleaner production practices for resource efficiency and initiated to establish eco industrial parks. The National Policy for Industrial Development has been prepared and now at the cabinet approval stage.

2.1.6.4 Waste sector

The responsibility for municipal solid waste management is vested in local authorities through the Municipal Council Ordinance, Urban Council Ordinance and Pradeshiya Sabha Act. At the national level, several key institutions oversee and support waste management by the MoE, the National Solid Waste Management Support Centre (NSWMS) under the Ministry of Provincial Councils and Local Government provides technical support and coordination, the Western Province Waste Management Authority (WPWMA) manages waste in the Western Province and the Central Environmental Authority (CEA) oversees environmental regulations.

As NDCs covered circularity in waste management extensively from waste prevention, reduction, separation etc., up to final disposal and in the absence of quantitative progress reporting due to lack of data, direct and specific policy support provisions from the National Policy on Waste Management (2019) with EPR process need to be included.

Sri Lanka has established a comprehensive policy framework for waste management over the past two decades. Various policies and plans are complemented by other national policies including the National Environmental Policy (2003), Updated National Policy on Climate Change (2023) and National Policy on Sustainable Consumption and Production (2019).

Sri Lanka's regulatory framework is based on the National Environmental Act No. 47 of 1980 and its subsequent amendments. Several crucial regulatory measures have been introduced to address specific waste management challenges. These include Gazette No. 2034/33 enforces a ban on polythene products below 20 microns, while Gazette No. 2034/34 imposes restrictions on food packaging materials made from polyethene. Gazette No. 2034/35 prohibits the use of high-density polyethylene (HDPE) bags, and Gazette No. 2034/36 strictly prohibits the open burning of plastics to prevent harmful emissions. Furthermore, Gazette No. 2034/37 bans the use of polythene in decorations, and Gazette No. 2034/38 prohibits the use of polystyrene products. Recently, Gazette No. 2211/51 introduced a ban on selected single-use plastic item.

The waste management infrastructure combines traditional approaches with modern technology, influenced by the country's waste composition of predominantly organic matter (60-70% biodegradable). Several large-scale treatment facilities operate across the country, including major composting operations at the Kerawalapitiya waste park managed by the Sri Lanka Land Development Corporation (SLLDC), and facilities at Karadiyana and Kalutara waste management projects under the WPWMA.

Waste segregation practices vary across the country, with local authorities implementing two to three-category separation systems (biodegradable, non-biodegradable, and recyclables), while some have added "burnable waste" categories for thermal recovery facilities. Healthcare facilities follow specific protocols separating clinical waste, general waste and recyclables. Private sector initiatives have expanded segregation to include detailed sorting of recyclables (such as cardboard, glass, metal and plastics) and reusable items like second-hand computers and clothing for repurposing rather than disposal.

Recent infrastructure developments demonstrate Sri Lanka's commitment to managing waste sustainably, with the country's first Waste-to-Energy plant at Kerawalapitiya in the Western Province (700 MT/day capacity) now operational. Further advancements include the Aruwakkalu sanitary landfill project in the North Western Province, designed to handle 1,200 MT/day and it is yet to be commenced. The Dompe sanitary landfill in the Western Province, processing 90 MT/day, serves as a model for sanitary landfill operations.

Private sector involvement has introduced innovative solutions such as the Metro Colombo Waste to Energy Project by Aitken Spence, INSEE Ecocycle (Pvt) Ltd.'s co-processing facility, and Sisili Hanaro EN Care (Pvt) Ltd.'s specialized healthcare waste management facility. These efforts are further strengthened by international cooperation through programs such as USAID's Clean Cities Blue Ocean project, GIZ's Waste to Value project and JICA-supported initiatives, alongside community-based projects implemented by non-governmental organizations.

While robust policy frameworks and institutional structures exist, implementation effectiveness varies across regions, highlighting the need for continued development of both infrastructure and capacity building. The achievement of Sri Lanka's NDCs in the waste sector will be crucial for reducing GHG emissions, with specific targets focusing on promoting circular economy, improved waste collection, enhanced treatment technologies and integrated waste management systems, alongside the need for systematic data collection, recording,

evaluation, reporting and feedback systems to monitor progress and inform decision-making for further continuous system improvements.

2.1.6.5 Forestry sector

The natural forest cover has decreased dramatically from 84% in 1881 to 29.2% in 2015, while the population increased from 2.5 million to 21 million during this period. Currently, the country's forest cover is being assessed by the Department of Forest Conservation.

The Forestry sector in Sri Lanka is particularly significant due to its dual role in climate change mitigation and adaptation, as well as its importance for biodiversity conservation being among the 36 global biodiversity hotspots. Significant emission reduction approaches in the sector include afforestation, reforestation, restoration of degraded lands and sustainable land management practices.

The Ministry of Plantation Industries, Department of Forest Conservation, Department of Wildlife Conservation, National Physical Planning Department, Land Use Policy Planning Department, Mahaweli Authority of Sri Lanka (MASL), RDA, UDA, SLLDC, State Timber Corporation and other agencies are responsible for implementing forestry-related activities under the NDCs.

The sector faces multiple challenges such as deforestation pressures, land degradation and increasing vulnerability to climate change impacts like droughts, floods and landslides. The Forestry sector has taken multiple efforts to mitigate the challenges. These efforts include land identification, reforestation, forest management and catchment protection programs, which are executed through partnerships between government bodies, the private sector and community organizations. The legal framework for forestry management is supported by environmental regulations and policies, such as the Forest Ordinance and the Environmentally Sensitive Areas Policy, ensuring sustainable practices and conservation.

2.1.6.6 Agriculture sector

The agricultural sector in Sri Lanka is characterized by a dualistic economy, comprising the non-plantation (domestic food crop) sub-sector and the plantation sub-sector. The non-plantation sector, which includes paddy, other cereals, oil crops, vegetables, fruits, floriculture, and spices, occupies 76% of the total cultivable land. The plantation sector, focused on tea, rubber and coconut, utilizes 24% of agricultural land. Agriculture significantly contributes to the economy, accounting for 12% of GDP, 22% of total exports, and 25% of the employed labour force (DOA, 2022).

While there are some fluctuations, the cultivated area for paddy is generally stable. There was a noticeable reduction in the cultivated area in 2017, after which the cultivated area gradually increases again. Major plantation category shows a steady gradual increase in cultivated extent over the years. Consistent expansion or maintenance of major plantation crops like tea, rubber which are long-term investments and less affected by annual fluctuations. The area allocated to OFCs is smaller compared to paddy but shows similar patterns of fluctuation. It generally ranges from 100,000 to 300,000 ha. Minor export crops have the smallest cultivated extent among the categories and exhibit a nearly flat trend with slight declines in some years.

The livestock sector in Sri Lanka is a vital component of the country’s agriculture and the rural economy contributing significantly to the food security, nutrition and the livelihood. The sector predominantly consists of small holder farmers who rely on livestock as a primary source or supplementary source of income and sustenance. Despite its importance the livestock sector in Sri Lanka faces significant challenges such as limited access to modern technology, inadequate veterinary services and vulnerability to climate change impacts like drought and feed shortage.

Cattle consistently make up the largest portion of the livestock population, followed by goats and buffaloes. The overall livestock population appears to have fluctuated over the years, with a peak around 2012-2013 and a decline afterward. The population stabilizes between 2017 and 2020. Sheep and swine have the smallest populations throughout the period. The poultry population fluctuated over the years, with a peak in each 2014 and 2020. Ducks make up a small portion (0.08 % compared to poultry) of the overall poultry population and show little variation compared to the main poultry population throughout the period.

2.2 Description and updates on mitigation sector NDCs

Sri Lanka submitted its initial NDCs in September 2016, following its ratification of the Paris Agreement. Sri Lanka subsequently submitted the updated NDCs on 31st July 2021 with the approval of the Cabinet of Ministers. The updated NDCs reflect a more ambitious, quantified, and comprehensive assessment of the country’s mitigation potential and vulnerabilities for the period of 2021-2030. This assessment is informed by the latest analyses, enhanced data and a thorough stakeholder consultation process.

The updated NDCs encompass six mitigation sectors. Table 2.1 shows the summary of NDCs targets.

Table 2.1: Summary of NDCs targets

Sector	Target % BAU	Target Year	Reference	Time frame	Scope
Energy (Power)	25	2030	BAU baseline	2021-2030	Gases- CO ₂ , CH ₄ , N ₂ O Unconditional contributions of Energy (5%), Transport (1%), Industry (4%), Waste (8.5%), Forestry (2%) and Agriculture (4%)
Transport	4				
Industry	7				
Waste	11				
Forestry	-7				
Agriculture	7				

2.2.1 Institutional arrangement

The institutional arrangement for implementation, monitoring and reviewing of NDCs is described in Section 2.1.1.

2.3 Information necessary to track progress made in implementing and achieving NDCs

Table 2.2 summarizes the progress of activities related to the implementation of NDCs in Sri Lanka for the period of 2021-2023. The table outlines the total number of NDC actions planned, the actions scheduled to be initiated, those actually initiated, scheduled for completion and the actions successfully completed during the reporting period.

While progress has been made in initiating adaptation and mitigation related actions, numerous challenges have delayed the commencement or completion of several initiatives. These challenges include financial constraints, gaps in technology and capacity building, shortages in human and physical resources, inadequate inter-agency communication and the broader impact of the national economic crisis. While certain sectors, such as water and agriculture, have demonstrated a higher rate of implementing NDC-related activities, others, like energy and transport, have significant delays.

Table 2.2: Summary of the progress of NDCs implementation

Sector	Number of NDCs	Total NDC actions planned	Actions scheduled to initiated	Actions initiated	Actions scheduled for completion	Actions completed	
						2021-2023	
Mitigation NDCs						Completed NDC Actions	
Energy	5	22	18	14	2	1	NDC 4.1
Industry	7	40	37	28	3	*	-
Waste	5	22	19	17	4	4	NDC 1.5, 4.1.1, 4.2.1, 4.2.3.2
Transport	13	37	34	17	8	2	NDC 13.1, 13.3
Agriculture	6	27	25	25	*	*	-
Forestry	5	37	1	36	*	1	NDC 1.1
Total	41	395	134	137	17	7	
Adaptation NDCs						Completed NDC Actions	
Fisheries	7	32	32	21	2	2	NDC 1.1, 2.2
Agriculture	6	30	30	30	2	2	NDC 1.1.1, 1.2
Livestock	3	19	15	9	1	*	-
Coastal & Marine	4	19	14	9	1	*	-
Biodiversity	5	19	10	10	*	*	-
Health	5	21	21	21	*	*	-
Water	10	74	66	60	3	3	NDC 7.1, 7.2, 7.3
Tourism & recreation	3	15	5	5	5	*	-
Total	43	229	194	160	15	11	

*Activities in progress / expected to be completed after 2023

The above progress is reported in accordance with the selected indicators shown in Table 2.3 and the definitions are given in Table 2.4.

Table 2.3: Description of selected indicators

Indicator(s) selected to track progress	Description
Sector wise GHG emissions	Energy, Transport, Agriculture, Industry, Forestry and Waste: sector-wise total GHG emissions and reductions
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s)	Base year: 2021 Reference Point (base year emissions): BAU baseline
Updates in accordance with any recalculation of the GHG inventory	Base year emissions will be recalculated in future national GHG inventories
Relation to NDCs	Sri Lanka as defined NDCs and targets sector-wise and the sector-wise total GHG emissions and removals is the most appropriate indicator to monitor the achievement of implementation of NDCs

Table 2.4: Definitions needed to understand NDCs

Definition needed to understand each indicator:	
Sector-wise GHG emissions and removals	The total GHG emissions and removals estimated based on IPCC-2006 and AR5. The GHG gases considered are CO ₂ , CH ₄ & N ₂ O and the total is expressed in terms of CO ₂ -eq, using relevant GWPs.

Methodologies and accounting approaches

Details of the methodologies and accounting approaches used to track progress in implementing and achieving the NDCs of Energy, Transport, Industry, Waste, Forestry and Agriculture are provided in Table 2.5.

Table 2.5: Methodologies and accounting approaches

Reporting requirement	Description or reference to the relevant section of the BTR
For the first NDC under Article 4	
Accounting approach, including how it is consistent with Article 4, paragraphs 13-14, of the Paris Agreement (Para. 71 of the MPGs)	The IPCC-2006 Tier-1 methodology ensures consistency, transparency and accuracy across all sectors. National total GHG emissions are calculated using the GWPs from the IPCC AR5, with sector emissions reported in CO ₂ -eq according to the MPGs. In addition, the 2019-IPCC refinement Tier 1 methodology was applied for the forestry sector. The national total GHG emissions and removals used to account for NDCs are the values reported in the NIR.
For the second and subsequent NDC under Article 4, and optionally for the first NDC under Article 4	
Information on the accounting approach used is consistent with paragraphs 13-17 and annex II of decision 4/CMA.1 (Para. 72 of the MPGs)	It will be reported for the second and subsequent NDC under Article 4.
Explain how the accounting for anthropogenic emissions and removals is in accordance with methodologies and common metrics assessed by the IPCC and in accordance with decision 18/CMA.1 (para. 1(a) of annex II to decision 4/CMA.1)	The total GHG emissions will be calculated using the IPCC-2006 and 2019 Refinement to the IPCC-2006. The global warming potentials (GWPs) presented in the AR5 of IPCC were used to calculate the national total GHG emissions in the CO ₂ -eq in accordance with the relevant provisions of the MPGs (18/CMA.1Annex)

Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) diversification plans:	The sector GHG emissions and removals for NDC progress monitoring will be estimated in accordance with the relevant IPCC Guidelines.
Explain how overestimation or underestimation has been avoided for any projected emissions and removals used for accounting (para. 2© of annex II to decision 4/CMA.1)	Uncertainty assessments will be carried out to avoid the overestimation and underestimation.
For each NDC under Article 4	
Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement:	It will be adhered.
Each methodology and/or accounting approach used to assess the implementation and achievement of the target(s), as applicable (para. 74(a) of the MPGs)	The implementation and achievement of the target in NDCs will be done by comparing the baseline (2021-2030).
IPCC Guidelines used, as applicable and available (para. 75(b) of the MPGs)	IPCC-2006 and subsequent amendments.
Report the metrics used, as applicable and available (para. 75(c) of the MPGs)	GWPs of a 100-year time horizon presented in IPCC AR5.
For Parties that address emissions and subsequent removals from natural disturbances on managed lands, provide detailed information on the approach used and how it is consistent with relevant IPCC guidance, as appropriate, or indicate the relevant section of the national GHG inventory report containing that information (para. 1(e) of annex II to decision 4/CMA.1, para. 75(d) (i) of the MPGs)	GHG emissions and removals from natural disturbances, if any, will be accounted for in accordance with the prescribed IPCC-2006, coupled with field inventory measurements where applicable.
Ensuring methodological consistency, including on baselines, between the communication and implementation of NDCs (para. 12(b) of the decision 4/CMA.1):	
Explain how consistency has been maintained in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines, between the communication and implementation of NDCs (para. 2(a) of annex II to decision 4/CMA.1)	There is no methodological inconsistency with respect to matters related to the scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines between the communication and implementation of NDCs.
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) and explain methodological inconsistencies with the Party's most recent national inventory report, if applicable (para. 76(c) of the MPGs) <i>for Parties that apply technical changes to update reference points, reference levels or projections, the changes should reflect either of the following (para. 2(d) of annex II to decision 4/CMA.1):</i>	The methodologies used to estimate GHG emissions and removals for accounting NDCs and the methodologies used in the GHG inventory are identical and consistent. There are no methodological inconsistencies between the most recent NIR and the NDCs accounting.
Technical changes related to technical corrections to the Party's inventory (para. 2(d) (i) of annex II to decision 4/CMA.1)	No technical changes

Technical changes related to improvements in accuracy that maintain methodological consistency (para. 2(d)(ii) of annex II to decision 4/CMA.1)	No technical changes
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The success of NDCs implementation should ultimately be evident in the mitigation of GHG emissions and removals at both sectoral and economy-wide levels. While Sri Lanka commenced the implementation of NDC-related measures and activities from 2021 to 2023, the country has not yet produced a complete GHG inventory for this period. However, it is possible to estimate GHG emission reductions in the sectors based on the mitigation measures that have been undertaken. Sri Lanka will report on its NDC implementation's GHG mitigation efforts and effects in the Second Biennial Transparency Report (BTR2).

2.3.1 Electricity (Power) sector

In 2021, the total installed power generation capacity in Sri Lanka was 4,813 MW, with approximately 56% of the total energy mix derived from renewable energy sources, including large and small hydropower, wind, solar and biomass. The country's gross electricity generation for that year reached 17,947.7 GWh, with renewable energy contributing to 51% of gross energy generation. Looking ahead, electricity demand is projected to grow by 5% annually. Future expansion programs for electricity generation are anticipated to effectively meet this increasing demand.

2.3.1.1 Electricity (Power) sector NDCs and emission reduction targets

The emission reduction targets of Electricity (Power) sector present the estimated mitigation of 9,819,000 tonnes of CO₂-eq unconditionally and 39,274,000 tonnes conditionally, for a total of 49,093,000 tonnes during the period from 2021 to 2030. These targets are assessed against the business-as-usual (BAU) scenario described in the Long-Term Generation Expansion Plan 2013-2032.

2.3.1.2 NDC progress

The progress of NDCs of Electricity (Power) sector is presented in the Table 2.6 to Table 2.8.

NDC 1 - Enhance renewable energy contribution to the national electricity generation mix by increasing Solar PV, Wind, Hydro and Sustainable Biomass based electricity generations (Target: Develop an additional capacity of 3,867 MW renewable energy over the RE capacity considered in Business-As-Usual scenario, out of which approximately 950 MW are on an unconditional basis and 2,917 MW on a conditional basis).

Table 2.6: NDC 1: Progress summary

Activities / Sub Activities	Unit	Baseline	Target (Addition)	Progress 2021-2023	Estimated GHG Emission reduction t CO ₂ -eq
1.1.1 Establish wind power plants	MW	178	865	87.95	452,508
1.1.2 Establish rooftop and ground-mounted solar PV	MW	425	2263	532	869,850
1.1.2.1 Encourage and increase women in the rooftop solar PV installation programme	No's	Approx.200 women out of 10,000 (2%)	2-5%	1%	NA
1.1.3 Power generation through sustainable biomass resources	MW	50	65	10	133,856
1.1.4 Establish large and small hydro power plants	MW	410	130	7.1	31,250
1.2 Develop the required transmission network infrastructure to enable integration of renewable energy	km	3160	480	92	The impact has been considered in NDC 4.

NDC 2 - Implement DSM measures by promoting energy efficient equipment, technologies, and system improvements in a national EEI&C programme.

Table 2.7: NDC 2: Progress summary

Activities / Sub Activities	Unit	Baseline	Target (Addition)	Progress 2021-2023	Estimated GHG tCO ₂ -eq
2.1 Realize energy saving of 2,603 GWh by phasing out incandescent bulbs as a conditional measure	GWh	14	2603	634	437,460
2.2 Realize energy saving of 5,189 GWh by introducing efficient lighting, fans, refrigerators, and chillers as a conditional measure	GWh	724	5189		

The total energy saving through the implementation of the above activities (2.1 and 2.2) have been reported as a cumulative figure.

NDC 3 - Conversion of existing fuel oil-based combined cycle power plants to Natural Gas (NG) and establishment of new NG plants as conditional measures (once the necessary infrastructure is available).

3.1 Conversion of existing 600 MW of fuel oil-based combined cycle power plants to NG

3.2 Establishment of new combined cycle power plants in place of anticipated coal power capacity additions in the BAU and gas turbines with approximately 700 MW of capacities to be operated from NG

Target of 1,430 MW installed capacity from natural gas (NG) driven combined cycle power plants is planned to be implemented from 2025 onwards. Tender documents under preparation for the conversion of 163 MW Kelanitissa combined cycle power plant. 350 MW Sobadanavi

combined cycle power plant was commissioned and operate with diesel. 350 MW capacity second LNG power plant project is in the procurement phase and 130 MW gas turbine power plant project to be re-tendered.

NDC 4 - Transmission and distribution network efficiency improvements (Loss reduction of 0.5% compared with BAU by 2030) as unconditional measures (Target-Approximately 1,848 GWh energy savings for the period of 2021-2030).

4.1 Carry out developments in the transmission network, re-conducting of existing transmission lines and reactive power compensation activities

4.2 Carry out the conversion from bare conductors to bundled conductors, line maintenance, load balancing and reduction of line length by installation of transformers in the distribution system

Continual improvement in grid transmission and distribution network efficiency can be observed over the years. Figure 2.2 shows the baseline transmission and distribution network loss as per the Long-Term Generation Expansion Plan (LTGEP) 2013-2032 with the actual loss. Maintained low grid losses could save equivalent estimate energy saving of 714 GWh during the period of 2021-2023.

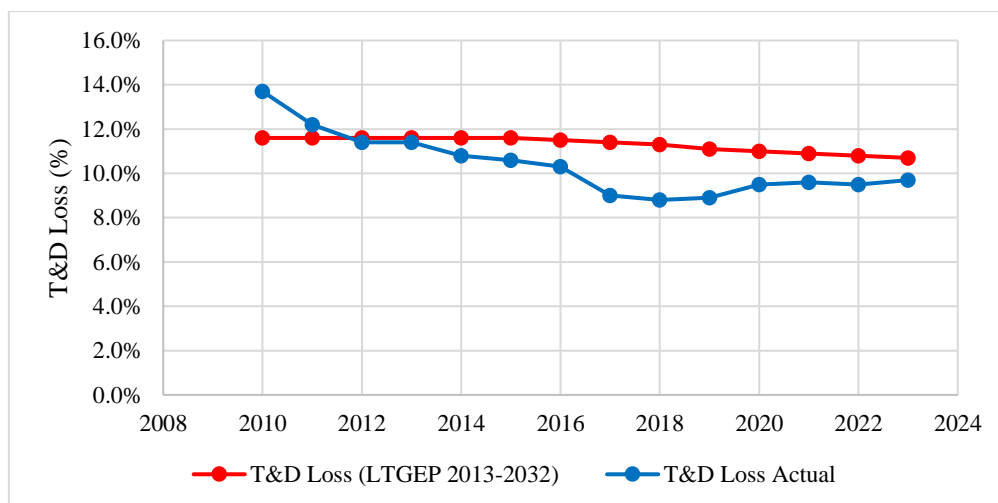


Figure 2.2: T&D Losses - baseline vs actual (2011 – 2023)

NDC 5 - Conduct R&D activities to implement pilot-scale projects for Non-Conventional Renewable Energy (NCRE) sources that have not yet reached commercial maturity and develop other grid supporting infrastructures as conditional measures.

Table 2.8: NDC 5: Progress summary

Activities / Sub Activities	Unit	Baseline	Target (Addition)	2021-2023	Estimated GHG Reduction t CO ₂ -eq
5.1 Conduct R&D activities to implement pilot-scale projects for NRE sources	Number of piloted projects	Initial Study	5	2	1,934
Floating Solar PV pilot projects at Chandrika Wewa and Kiriibban Wewa	MW	0	2	2	Integrated into NRE contribution
Semi-transparent Solar PV: Agri-voltaic pilot project in Hanthana	MW	0	Pilot Project	Pilot completed	Integrated into NRE contribution
5.2 Develop pumped storage hydro power plants and pilot-scale storage systems	Number of potential sites	0	10	10 sites identified	Integrated into RE grid efficiency
5.3 Introduce ICT interventions such as Smart Grids Technologies to support integration of intermittent renewable energy to the system	kWh (Battery Energy Storage System capacity installed)	0	50	300	Integrated into RE grid efficiency

The Structured summary of tracking progress made in implementing and achieving the NDCs of Electricity (Power) including Transport, IPPU, Waste and Forestry sectors is shown in Annex 21.

2.3.1.3 Women in Electricity (Power) sector

Women promote the use of renewable energy such as clean cooking stoves, sustainable fuelwood, domestic solar and biogas. Efficient energy systems will benefit women by providing time for entrepreneurship and quality time with their families while building a low carbon footprint.

NDC 1 and NDC 5 defines clear targets to increase women representation in Electricity (Power) sector. Following NDC targets were set for increasing women penetration on the renewable Electricity (Power) sector in Sri Lanka.

Encourage and increase women in the rooftop solar PV installation programme: Expected to increase the women participation by 25% through "Hiruliya" program. In 2023 the women representation increased in entire field from 16% to 20% and it is expected to increase to 25% under the new Hiruliya programme 2024.

Encourage women in supplying sustainable biomass for power plants: Women suppliers have registered with biomass power plants and processing mills where biomass is supplied for thermal energy use. Such companies are applying for SLS 1551:2016 standard for sustainable produced fuelwood certification and SLSEA represented the Audit Proceedings.

Establish an institutional mechanism to enable the collection of sex disaggregated data: No significant progress, however, SLSEA entered into agreement with World Bank/ADB for We-Power programme to increase women participation in the Electricity (Power) sector.

Studies with USAID gender experts have explored the social impact of grid electrification in the Knuckles region, focusing on the We-Power program. Efforts are being made to address women's employment issues through the development of an NVQ syllabus for various renewable Electricity (Power) sectors, including hydro, solar, wind and biomass, in collaboration with NAITA.

2.3.2 Transport sector

In order to track the progress of transport sector's NDCs, BTR1 preparation process employs a set of specific indicators focusing on both GHG and non-GHG measures. The indicators used in BTR1 reflect current data availability and emphasize shifts in fuel consumption, fleet composition and infrastructure development for sustainable transport. The following indicators in Table 2.9 have been selected for the transport sector in BTR1, with an aim to assess progress towards emissions reduction targets and sustainable transport practices.

Table 2.9: Transport sector indicators

Indicator	Description	Relevance to NDC Progress Tracking	Data Source
Percentage of Electric and Hybrid Vehicles in Total Fleet	Measures the share of low-emission vehicles (EVs and hybrids) in the total vehicle fleet.	Tracks the shift towards low-emission vehicles as part of emission reduction efforts.	DMT and NTC
Annual Fuel Consumption by Type	Tracks fuel consumption trends in the transport sector, categorized by fuel type.	Provides insights into fuel dependency and evaluates shifts towards alternative fuels to meet NDC goals.	CPC
Electric Vehicle (EV) Charging Infrastructure Development	Monitors the number of EV charging stations installed annually.	Supports infrastructure readiness for EV adoption, a key element of emission reduction.	MOT and private sector entities
Vehicle Kilometers Travelled (VKT) by Public Transport Modes	Measures total VKT for buses and rail services, indicating public transport use levels.	Encourages public transport use to reduce reliance on private vehicles and GHG emissions.	SLTB and SLR
Reduction in Average Vehicle Age in Public Transport Fleet	Tracks the average age of public transport vehicles, focusing on fleet modernization.	Modernizing public transport fleets improves fuel efficiency, lowering overall sector emissions.	SLTB, SLR and NTC
Proportion of Non-Motorized Transport (NMT) Infrastructure developed in Urban Areas	Tracks the development of NMT infrastructure, such as bicycle lanes and pedestrian pathways, in urban areas.	Encourages active, low-emission transport options, reducing dependence on motor vehicles.	MOT and local authorities
Annual Vehicle Revenue Licenses Renewed (Active Fleet Estimate)	Uses annual revenue license renewals to estimate the number of active vehicles.	Provides a measure for tracking the active vehicle fleet contributing to emissions.	DMT

2.3.3 Industry sector

2.3.3.1 Progress in implementing and achieving NDCs of Industry sector

Seven numbers of NDCs are defined for the industry sector and 40 numbers of indicators are defined to track the progress of these NDCs. The progress is compared with the identified baseline(s) of the selected indicators. Out of the 40 selected indicators the GHG emission reduction can be estimated only for 10 indicators. However other indicators result in the reduction of GHG though it is not estimated. Table 2.10 shows the progress of NDCs by 2023 against the selected indicators. Out of the 40 indicators, some progress has to be made by 2023 is only for 37 indicators and for the other 3 indicators progress has to be made after the year 2023. Out of 37 indicators for 11 indicators there is no progress made by the year 2023.

Table 2.10: Progress in implementing and achieving NDCs of Industrial sector

NDC/ Action	Indicator	Baseline	Target	Time frame	Progress		
					2021	2022	2023
NDC 1: Continue fuel-switching to sustainable biomass energy and improve user efficiency in selected industrial sub-sectors							
1.1	Number of industrial furnaces and boilers converted to sustainable biomass	500	90	2021 -2030	16	3	0
1.4	Number of Hot water systems installed by switching fossil fuels to biomass energy in government institutions such as hospitals, prisons, arm forces, hostels universities	25	192	2021 -2030	5	4	10
NDC 2: Enhance the application of Resource Efficient Cleaner Production (RECP) practices in selected industrial sub-sectors							
2.1	Percentage of industries and number of industries that CP and Energy Audits conducted	300 CP and Energy Audits	25%	2021 -2030	276 energy Audits 10 RECP Audits	233 energy audits, 10 RECP Audits	444 energy audits, 20 RECP Audits
2.2	Number of industries adopting RECP practices and	250	400	2021 -2030	17 EE projects implemented		

	acquiring low carbon technologies and processes						
2.3	Percentage of relevant industries engaged in water use efficiency improvements	100 industries	50% of relevant industries	2021-2030	NE	5 industries	NE
2.4.1	Amount of energy saved by installing HEM for water sector	775 GWh	7 GWh/y	2021-2030	NE	NE	1.4 GWh
2.4.2	Energy saving through installing VSD in Tea Industry	590 GWh	2900 GWh	2021-2030	75 Industries	NE	NE
2.4.3	Energy saving through replacement of inefficient chillers with efficient chillers and refrigeration technologies for supermarkets, textile and apparel industry, hotels and dairy industries	1300 GWh	170 GWh	2021-2030	6 chillers	11 chillers	NE
2.5.7	Percentage of relevant industries engaged in introducing VOC emission controlling system for painting, tire and printing industries	to be establishes	30%	2021-2030	NE	NE	CEA has selected 20 industries in the western province
NDC 3: Establish eco-industrial parks and villages							
3.1	Numbers of Existing BOI EPZs transformed to eco IPs Percentage of existing non-BOI IPs transformed to	0	BOI, 50% of non-BOI	2021-2030	2 WWT plant upgraded	2 WWT plant upgraded	1900 trees planted in 3 zones

	eco IPs by in cooperating maximum possible green industrial concepts						
NDC 4: Introduce Circular Economy concept to selected industrial sub-sectors and selected industrial zones							
4.1	Number of industries and subsectors identified for implementing circular economy by conducting a survey	No Data	All relevant industries	2021-2022	Industry sector diagnostic assessment conducted and relevant policy recommendations were provided		
NDC 5: Introduce tri-generation facilities to selected industrial parks							
5.1	Numbers of Rapid assessment completed for tri generation potential in 10 industrial Parks	1	9	2021-2024	0	0	4 IPS
NDC 6: Incentivize GHG reduction of clinker production in the cement industry							
6.1	GHG reduction through avoiding production of clinker by amendments to SLSI standard for cement production and introduction of them	Existing SLSI Standard	Not fixed	2021	Replaced clinker with 86,456 tons of fly ash	Replaced clinker with 121,073 tons of fly ash	Replaced clinker with 111,643 tons of fly ash
NDC 7: Generic enabling activities							
7.1	Percentage of industries adopting various ISO system having focus on GHG reduction such as ISO 50001 and ISO14064-1	100 industries	25%	2021-2030	50	NE	77
7.3	Number and percentage of environment related ISO certified industries entered into	0	to be established	2021-2030	National Green Procurement Policy (NGPP)preparation is in progress	NGPP is ready for cabinet approval	NGPP was approved

	sustainable (Green) Public Procurement System of Sri Lanka						
7.4	Number and percentage of industries benefitting from green financing	to be established	SMILE III - Rs.1.5 bn /y, E-Friend II loan scheme Rs.600 Mn/y	2021-2030	170 industries	85 industries	288 Industries
7.5	Policy package for siting IPs and standalone industries with new concepts like circular economy, industry ecology, RECP etc.	0	Policy package	2021-2024	National Policy for Industrial Development of Sri Lanka is pending for cabinet approval		
7.6	Percentage of industries having access to sustainable biomass by adopting policy tools such as SLS 1551: 2016	to be established	100%	2021-2030	5 industries certified		

2.3.4 Waste sector

The waste sector contributes to Sri Lanka's greenhouse gas emissions through various waste management practices including solid waste disposal, biological treatment, wastewater, treatment and waste incineration/open burning.

2.3.4.1 Progress of NDC implementation in Waste sector

The waste sector aims for an 11% GHG reduction by 2030, with an 8.5% reduction through domestic resources, while an additional 2.5% through international support and technology transfer. This will result in a total reduction of 2,549,000 tCO₂-eq, with 1,969,000 tCO₂-eq from unconditional measures and 580,000 tCO₂-eq from conditional interventions.

Table 2.11 shows the progress of NDC implementation in Waste sector. The information was gathered from key institutional stakeholders, including the WPWMA, NSWMSC, BOI, NWSDB, SLLDC and CEA, among other relevant organizations. Data were also collected from various reports published by the MoE and other relevant organizations.

Table 2.11: Progress made in implementing and achieving the NDC in the Waste sector

NDC 1: Improve “Circular economy” practices in all MSW generation sources						
Activities / Sub Activities	Implementation Responsibility		Key Performance Indicator	Means & Source of Verification	Baseline	Progress 2021 - 2023
	Lead Agency	Other Key Agencies	(KPI)			
1.1.1: Reduce MSW generation growth rate by 10 %	Ministry in Charge of PCs, and LAs	LAs, WPWMA, NSWMSC, MoE, PCs	Reduction of waste generation growth rate	Derived from annual waste auditing - WPWMA for WP, NSWMSC for other provinces	2%	Western Province: 2021 = 1.9%, 2022 = >1.8%, 2023 = 1.9% Other province: No information available.
1.1.2: Total coverage for treatment and disposal of industrial solid waste & effluent (Major industries; BOI Zones, non-BOI Industrial Parks, BOI approved standalone industries, other industries and other SMEs)	MoI	MoE, BOI, IDB, RISC, UDA, ISB, LINDEL, CCC, CEA, LAs, NWPEA	The percentage covered of industrial solid waste & effluent treatment and disposal	Data Collection from CEA, BOI and other industry zone operator	BOI SW generation rate in BOI zones is 269 Mt/day and effluent generation is 48,110 m ³ /day	Industrial SWM systems were completed in 5 BOI zones (Katunayake, Biyagama, Seethawaka, Koggala and MAS fabric park) & Wathupitiwala, Meerigama & Malwatta
					Others Baseline to be identified	All BOI zones Effluent (16) In progress – Eravur Textile Manufacturing zone, Arubokka Pharmaceutical Zone, Bingiriya Industrial Zone
1.2: Improve the segregation of MSW at source and increase number of segregation categories						
1.2.1: Increase the level of waste segregation (perishable, non-perishables)	MoPC&LG	NSWMSC, LAs, PCs, WPWMA	Percentage of waste segregation	Data source for WPWMA, Other Provinces NSWMSC	In the WP = 60%	Western Province: 2021 = 42% (WP waste segregation has reduced due to collection of mixed waste by the CMC for WtE facility) 2022= 40%, 2023 = 44%
					Other Provinces = 30% (average)	2021 – The Kandy Municipal Council has implemented an exemplary data driven waste collection system that operates on a weekly schedule, with specific days allocated for different waste categories. 2022 & 2023 - Varies from 25% to 57%
1.2.2: Increase number of waste segregation categories from 2 to 3 (perishable, potential recyclable, residual) at source	MoPC&LG	NSWMSC, WPWMA, LAs,	Number of LAs those who have increased their waste segregation categories from 2 to 3	Data source for WP - WPWMA, Other Provinces - NSWMSC	In the WP = 30 number of LAs in 2020, In other Provinces = 60 number of LAs in 2020	Western Province: 2021 = 30 LAs, 2022= 40 LAs, 2023 = 40 LAs 49 LAs in the WP.
1.3: Improve MSW collection & transportation systems (With appropriate infrastructure facilities through investments in: Vehicles, Transfer stations, Collection centres, Technology: Route-planning, GPS monitoring, Capacity Building)	MoPC&LG	NSWMSC, LAs, PCs, WPWMA, UDA	Percentage of Population covered by the waste collection services	WPWMA	WP = 60%	Western Province: 2021 = 60%, 2022 =55-60 %, 2023 = 65%
				Other Provinces - NSWMSC	(MC = 65%, UC = 72%, PS = 32%)	Other provinces: 2021= 40%, 2022 =35%-40%
					Other provinces = 30%	Waste collection was interrupted during COVID and the fuel crises of the country in 2021-2022.

1.4.1: Increase current recycling percentage in Western Province (Trash reverse vending machines, New tech separators etc. Streamline collections. Waste collection, segregation centres, etc.)	MoPC&LG	NSWMSC, Private Sector recyclers and collectors, Brand owners	Percentage of formal waste recycled by LAs (on collection basis) and the amount of recycling through the informal sector MT/day	Data bases of WPWMA and CEA, CCC	Formal Recycling % =2% (32 MT/day) (LAs on-collection basis)	Formal recycling - 2021 = 1%, 2022 =1%, (15 Mt/day), 2023 = 2%
					Informal Recycling 40MT/day	Informal Collection and Recycling 40 Mt/day A company has started installing reverse vending machines in 2022.
1.4.2: Increase recycling percentage of the rest of the country	MoPC&LG	MoE, CEA, NSWMSC, NWPEA, Private Sector recyclers and collectors, Brand owners	Percentage of formal waste recycled by LAs (on collection basis) and the amount of recycling through the informal sector in MT/day	Data bases of WPWMA and CEA, CCC	Formal Recycling % = 1.0% (LAs on-collection basis) and the	2021, 2022 = Formal recycling = 0.5%, 2023 = 1%
					Informal Recycling 20 MT/day	Informal recycling 26Mt/day (Availability of new Material Recovery facilities, better streamline collection, support from various organizations etc.)
1.4.3: Ensure recycling of Polyethylene Terephthalate (PET) bottles	CEA	MoPC&LG, MoE, CCC, WPWMA, NSWMSC, NWPEA	% of PET recovery by weight	CCC/CEA data bases	30% by weight	2021=30%, 2022=32%, 2023= NE
1.4.4: Ensure recycling of High Impact Polystyrene (HIPS) cups - (Collection of 960 MT per year)	CEA	MoPC&LG, MoE, CCC, WPWMA, NSWMSC, NWPEA	% of HIPS recovery by weight	CCC/CEA data bases	3% by weight	2021=3%, 2022=4%, 2023= NE
1.4.5: Ensure recycling of Tetra packs, metallized films and other recyclable packaging materials	CEA	MoPC&LG, MoE, CCC, WPWMA, NSWMSC, NWPEA	% of recovery by weight	CCC/CEA data bases	0.01% by weight	No information available
1.5: Implement regulatory framework to control high waste generating products	CEA	MoE, MoI, MoH, LAs, CCC, CAASL, SLSI, SLIP, ITI, Environment Police	Number of Products regulated	CEA	Number of products already regulated = 7	Items already regulated: Plastic Lunch sheet, HDPE bags, PS Lunch boxes, sachet packet (less than 20g/20ml), plastic cotton bud, inflatable toys, PET and PVC agrochemical packaging, plastic cutleries, garland, string hopper plates, straws
						Items Expecting to be regulated. Shopping bags (small), plastic grass mat, wrapping cover of incense sticks
NDC 2: Manage Biodegradable waste components through biological treatments						
2.1.1: Rehabilitate / restore or improve existing composting facilities for capacity & quality enhancement and for the adoption of new technologies	MoPC&LG, SLLDC	MoA, UDA, Fertilizer secretariat, NSWMSC, WPWMA	Percentage of existing compost plants rehabilitated/restored, and the capacity enhanced in MT/day	WPWMA, Other provinces - NSWMSC	Total number of existing composting facilities 195	Total existing number of composting plants
						In the WP = 27 –and operational capacity 263Mt/Day) & Design capacity is 300Mt/Day
						Other province = 168 and their design capacity around 700 Mt/day
2.1.2: Introduce new composting facilities for potential/prospective Local Authorities.	MoPC&LG	MoE, UDA, NSWMSC, WPWMA	All LAs covered for composting	WPWMA, Other provinces - NSWMSC	Existing composting facilities = 195 and capacity is around 1,000 MT/day	WMA has introduced a new compost plant at Homagama, witch capacity is around 5Mt/day
2.1.3: Adopt new technologies to enhance the productivity of composting facilities	MoPC&LG, SLLDC	MoST, LAs, PCs, Academia, WPWMA, NSWMSC	Productivity of composting facilities	WPWMA, Other provinces - NSWMSC	WP = 53%, Other provinces = 5%	Western Province - 2021= 53%, 2022 =40%, 2023 = 40% (Other province -Information need to be collated.)

2.1.4: Improve quality/maintenance and gradually upgrade them to SLSI standards	MoPC&LG, SLLDC	MoA, DoA, SLSI, Fertilizer secretariat, WPWMA, NSWMSC, LAs, CEA	Number and percentage of compost plants registered in the Fertilizer Secretariat	WPWMA, Other provinces - NSWMSC	WP= 0, (0%)	Western Province: 2021 =0, 2022=5
					Other Provinces = 01, (0.6%)	Other provinces: 2021 = 1, 2022 =2
			Number of plants that have received SLSI standard		SLSI standards = 0	There are 27 composting facilities in the WP out of them 25 has already applied for registration, while other provinces five (05) have applied for the registration.
2.1.5: Compost yards complying with the Environment Regulations	MoPC&LG, SLLDC	WPWMA, NSWMSC, LAs, PCs, CEA	Number and percentage of compost plants that have received EPL	Reports from CEA, WPWMA, NSWMSC, LAs	WP = 11, (40%)	Western Province: 2021 = 45%, 2022 =50%, 2023 = 55%
					Other Provinces = 8 (5%)	Other Provinces: No information available
2.1.6: Promote household-level composting	MoPC&LG	LAs, PCs, WPWMA, NSWMSC	Percentage of the households that do not depend on degradable waste disposal service offered by their respective LA	WPWMA, Other provinces - NSWMSC	WP = 5%	Western Province: 2021=5%, 2022=8%, 2023 = 10%
		NGOs, INGOs			Other provinces 10%	Other provinces 10%
2.2: Apply suitable treatment facilities for liquid waste						
2.2.1: Introduce central (networked) sewage and wastewater treatment facilities for selected local authorities	NWSDB	MoPC&LG, MoE.MoWS, , CEA, LAs	Percentage of population covered by sewer networks	NWSDB Progress reports	Population connected to sewer networks 2.1%	Progress, Connected to sewer network
						2021= 2.1%, 2022 =2.1%
						Due to the financial crises, there is no significant progress reported
2.2.2: Introduce night soil treatment facilities for disposal of faecal sludge from septic tanks	MoPC&LG, NWSDB	LAs,WPWMA, PCs	Percentage of safe sanitation coverage by facilitating safe disposal of faecal sludge from septic tanks	Reports from LAs, CEA - Database / receiving EPL	11.10%	2021=18.0%, 2022 = 26%
2.2.3: Improvements for the treatment and appropriate disposal of industrial wastewater						
2.2.3.1: BOI Zones	BOI	MoI, NWSDB	Number of BOI zones subjected to improvement of their treatment and disposal facilities for industrial wastewater	Reports form BOI	Total numbers of BOI Zones covered 01	2021=1 (Koggala)
					(Total number of BOI zones = 16)	2022=3 in progress (Biyagama, Mawathagama, Wathupitiwala) 2021=12, 2022 = 13 Including Seethawaka EPZ)

2.2.3.2: Non-BOI Industrial Parks	MoI	CEA, NWSDB, IP operators, RISC, IDB, LINDEL, ISB, UDA	Percentage of non-BOI zones subjected to improvement of their treatment and disposal facilities for industrial wastewater	CEA-Database, MoI and records of other industry parks operators	10% Around 3 (Ratmalana, Bataatha, LINDEL)	No reliable information available at present. Proposed to establish an active /live data base for the sector and action should be taken by the respective key agency
2.2.3.2.1: Establishing a data base for Non-BOI Industrial Parks for data gathering including industrial wastewater generation and treatment	MoI,	BOI, UDA, LAs, CEA, NWPEA	Data base covering all industries	Report form CEA, NWPEA	Stand-alone data bases	No initiatives taken yet
2.2.3.3: Standalone industries acquiring EPL license	CEA	MoI,LAs, NWPEA	Percentage of BOI and standalone industries requiring EPL license	Data base on MoI and CEA & NWPEA	Over 80% of BOI approved enterprises have EPL (BOI – Total Licensed Enterprises - 2,407 Out of which 361 are within the Zones)	BOI – By 2022 - 2,407 industries licensed enterprises (Variation exists due to present conditions)
					Around 70% of non-BOI enterprises have EPL	Non-BOI - No reliable information available at present, action is proposed to established an active data base for the sector and action should be taken by the respective key agencies
2.2.4: Enhance capacities of existing treatment plants or apply new technologies	Authority of respective Industry trial parks or respective operators	MoI, CEA, WM service providers	Percentage of treatment facilities enhanced their capacity with new technologies	Data from LAs, NSWMSC, CEA Database	BOI – Completed 01 (Koggala -1,000 m ³ /day)	BOI - Completed 01 (Koggala 1000 m ³ /Day) Horana - 2000m ³ /Day, Seethawaka -5000m ³ /Day)
					Non-BOI - Baseline to be identified	In progress 03 (Mawathagama - 500 m ³ /Day, (Improvements to the existing CWWTP)
2.2.5: Establish treatment facilities with disposal for industrial sludge	Authority of respective Industry trial parks or respective operators	CEA, NWSDB, WM service providers	Numbers of treatment facilities enhanced to treat industrial sludge	Data from LAs, NSWMSC, CEA Database	BOI Zones = 04	2021 = 3 BIO Zones
						2022 = 2 BIO Zones for stone sludge management (MAS fabric park -bricks making project from CWWTP sludge, Katunayake & Koggala CWWTP sludge -Composting)
2.2.6: Introduce pollution load-based pricing system for liquid waste	MoE, CEA	MoI, MoUD&H, NWSDB, CC&CRMD, BOI, ITI	Percentage of BOI zones introducing Pollution Load Based / Volume Based pricing system (gazetted and implemented)	Relevant gazette notification and CEA reports	0	Pollution Load Based / Volume Based pricing system is not in place in BOI zones at present
2.3: Where composting is not practical, use biogas technology for the management and treatment of biodegradable solid waste with triple benefits (CH ₄ management, energy recovery option and organic nutrients)						
2.3.1: Facilitate biogas technology in selected sectors (mass scale commercial-establishments and households)	In charge of respective selected sector	WPWMA, CEA, SLSEA, Service providers	Number of institutions /establishments with biogas systems	Data sources from CEA. Private institution	20,000 number of individual units	NE

2.3.2: Biogas cluster system for selected LAs	In charge of respective LAs, Private sector	CEA, SLSEA, Service providers/Developers	Number of centralized biogas system in operation	Data sources from CEA, WPWMA, NSWMSC	No cluster-based biogas system established for LAs	The centralized biogas plant at Matara MC (50t/day) is under construction.
NDC 3: Introduce energy recovery using non-compostable non-recyclable waste which cannot be managed by other means						
3.1: Establishment of already committed 2 waste-to-energy generation facilities for major/prospective municipalities. (Capacities 750MT/day and 500MT/day)	MoUD&H, Respective Developers	MoP&E, SLSEA, CEB, WPWMA, CEA, CMC and LAs	Number of Waste-to-energy facilities in operation and the total capacity	Data sources from WPWMA, CEA	One facility 750 MT/day	2021=Kerawalapitiya WtE facility is in operation the capacity is 600 Mt/day
						2022= Kerawalapitiya WtE facility is in operation the capacity is 750 Mt/day
						2023 = Kerawalapitiya WtE facility is in operation the capacity is 750 Mt/day
3.2: Make policy instrument to clearly define the purpose of waste-to-energy and plan the phasing out of preferential feed-in-tariffs	MoUD&H, MoE	MoP&E, CEB,	Policy instrument	Records of MoUD&H	No policy instrument	National Waste Management Policy 8.1.6 - Infrastructure facilities that need a steady waste supply must balance waste reduction efforts, expected decreases in waste from better management, and likely increases in waste from economic growth.
3.3: Formulation of regulations on controlling the disposal of non-compostable and non-recyclable waste through waste to energy facility	CEA	MoUD&H, MoE	Regulation in place	Data sources from MoE, CEA	No regulations	National Waste Management Policy 8.1.6
3.4: Introduce other thermal treatment technologies particularly Pyrolysis technology	WPWMA & NSWMSC	MoUD&H, Service providers, CEA, CPC	Total number other thermal treatment facilities (Pyrolysis, Gasification) are in operation and their capacity in MT/day	Data sources from WPWMA and NSWMSC	Total numbers of plants – 05	Tire Pyrolysis plant
					(Tire pyrolysis = 4, total capacity 600MT/day,	2021, 2022= No 4, 600 Mt/day
					Mixed plastic co-processing =1, capacity 150 MT/day)	Co-Processing of mixed plastic 2021, 2022, 2023 = No 1. (INSEE), 150 Mt/day)
NDC 4: Use of sanitary landfill for the disposal of residues (non-compostable, non-recyclable, non-recoverable, and residues from waste to Energy plants) will be increased from the current level of 5% to 100% on weight basis						
4.1: Operationalize policy & regulation for siting (locating) and implementation of sanitary landfills (with CH4 capturing) according to the waste generation and management forecast						
4.1.1: Identifying potential sites for new sanitary landfills	UDA	MoUD&H, MoE, MoPC&LG, CEA, WPWMA, NSWMSC	Number of new site(s) identified and their design capacity	Site identification report by UDA, CEA (EIA/ER)	Identified – 09 sites for 09 Provinces by the UDA	2021, 2022, 2023 = 9 (Identified by the UDA) Dompe sanitary landfill Capacity = 90 MT/Day, Aruwakkalu , Capacity = 1200 Mt/Day (Not yet commissioned)
4.1.2: Optimize the supply-chain utilization and management of available sanitary landfills	MoUD&H	LAs, WPWMA, CEA, NSWMSC	Number of LAs connected with the supply chain and the total amount of Waste diverted	Data sources from NSWSC, WPWMA, Facility operators	Aruwakkalu = 1,200MT/day & no LAs using the facility	By 2023: Aruwakkalu SL Design capacity =1200MT/day, operational capacity=0
					Dompe = 90MT/day & Two LAs + Industries	Dompe SL: Design capacity 90MT/day, Operational capacity= 50MT/day
						No of LAs served =1, Some industry wastes are also accepted.

4.1.3: Introduce transfer stations and transport infrastructure	MoUD&H	LAs, NSWMSC, WMA- WP, CEA	Total No of transfer stations in operation and their total capacity	Record of MoUD&H	No properly developed transfer stations are in operation	2021= No transfer stations are in operation 2022 = In progress Kelaniya, Kaluthara, Pohorawattha transfer stations are under construction
4.1.4: Introduce cluster-based sanitary landfill sites to unserved local authorities	MoUD&H	CEA, LAs, WPWMA, NSWMSC, Donor agencies	Numbers of LAs connected to Aruwakkalu and Dompe sanitary landfills	Records of MoUD&H	Aruwakkalu – 0	Aruwakkalu facility: Not yet commissioned
					Dompe – 02 LAs served	Dompe Facility – 01 LA
4.2: Rehabilitate (active and abandoned) existing waste dump sites (50% of 340 sites by 2030)						
4.2.1: Preparation of technical manual for rehabilitation of dumpsite by 2021	MoE	WPWMA, NSWMSC, CEA, Academia	Published Technical manual	MoE records	Draft manual for dumpsite management	2021= guideline for safe closure and rehabilitation of Municipal Solid waste Dumpsite in Sri Lanka has published in February 2021 by the MoE, 2022 =Technical manual has published
4.2.2: Safe closure of dump sites by 2030	UDA	LAs, WPWMA, NSWMSC, CEA	Number of dumpsites closed	Data source of WPWMA and NSWMSC	WP = around 20	2021= 21
					Other provinces 1 (Badulla dump site)	2022= 21
					(Total no of existing dump sites 339)	There were 55 dumpsites in the province out of which 34 dump sites are not in operation at present
4.2.3: Reduce open dump burning						
4.2.3.1: Develop Disaster contingency plans/ Preparedness plan for Disaster Management	NSWNSC, WPWMA	MoUD&H, DMC, CEA, NBRO	Numbers of high-risk dumps sites having contingency plans	Data source of NSWMSC, WPWMA	Three Dump sites	2021=3, 2022=3, 2023=3
					(Karadiyana dump site, Meethotamulla dump site and Seethawaka dump site)	A disaster management plan has been developed and in operation for Karadiyana Dump site
4.2.3.2: Develop & introduce proper management plan with a monitoring mechanism for open dumps	NSWMSC, WPWMA	LAs, CEA, DMC, NBRO, UDA	No of open dumps having a management plan with a monitoring system	Data source of NSWMSC, WPWMA	Three open dumps	2021=3, 2022 = 3, 2023 =3
					(Karadiyana dump site, Meethotamulla dump site and Seethawaka dump site)	
4.3: Introduce Gas measurement and recovery systems for potential open dump sites (abandoned and existing)	MoUD&H	WPWMA, NSWMSC, CEA, Service providers,	Number of dump sites rehabilitated with Gas measurement and recovery systems	Data sources from MoUD&H, WPWMA, NSWMSC	Potential sites to be identified	No information available on potential dump sites for gas Measurement and recovery.
NDC 5: Generic enabling activities						
5.1: Update or introduce the required legislations to facilitate and enforce the implementation of NDCs	CEA and all respective lead agencies	MoUD&H, MoE, MoPC&LG, MoI	Number of Legislations enforced	Data sources from CEA	CEA – 11 Legislations	2021, 2022= totally 11 legislations are in place.
					(by 2020 11 Regulations have been published for solid waste management)	2021: 02 regulations (Policy statement 8.6.4 of the National Waste Management Policy requires revising the existing

						Laws and Regulation to implement circular economy practices.)
5.2: Introduce a mechanism for waste generation forecasting and a tracking system to monitor collection and disposal	MoPC&LG	MoE, NSWMSC, WPWMA, CEA, ICT Service Providers	Number of LAs having tracking systems	Data sources from MoE	04 LAs have systems	2021, 2022 = 04 LAs in place of the mechanism
				WPWMA		Policy statements 8.1.3 and 8.1.4 of the National Waste Management Policy (2019)
				NSWMSC		
5.3: Introduce legislation to make segregation of waste at household level mandatory	CEA	MoPC&LG, MoE, NSWMSC, WPWMA	Legislation	Data source of CEA	Western Province Waste Management Rules No 01 of 2008 and Directive given by the MoPC&LG	2021,2022= WP solid waste management Rules No 01 of 2008
5.4: Introduce or amend necessary legal framework and instruments to initiate Market-Based Instruments (MBIs) and non-market-based instruments to incentivize and promote sustainable production and consumption patterns	MoE	MoPC&LG , MoI, CEA, WPWMA, NSWMSC	Market based instrument and non-market-based instruments	MoE records	EPR and PPP system are included to the amended waste management policy (2019)	2021, 2022=EPR, PPP, 2023 = EPR Policy drafted.
5.5: Implement “Polluter Pays Principle” for mixed waste generators	MoPC&LG	MoE, CEA, LAs, PCs, WPWMA, NSWMSC	Percentage of Local authorities introducing service charge systems for commercial sector	WPWMA, NSWMSC	WP: execution of Service charging system for commercial places = 70%	Western Province
					Other Provinces: 5%	2021= 70%, 2022=75%, 2023 = 75%
5.6: Conduct awareness programmes for behavioral changes of waste generators and capacity building programs for waste management personnel	MoPC&LG	WPWMA, NSWMSC, LAs, MoE	Number of capacity building and awareness programs conducted annually	Western Province - WPWMA, Other provinces - NSWMSC	Annual average capacity building programs = 150 and awareness programs = 500	2022 = Total Number of Program conducted in the WP around 500 Policy statement 8.31 and 8.32 of the National Policy on Waste Management (2019)
5.7: Introduce public-private-partnerships to finance waste management projects facilitating NDCs	MoE, MoPC&LG	LAs, WPWMA, NSWMSC	Number of PPPs	Western Province - WPWMA, Other provinces - NSWMSC	In the Western Province: 03 PPPs for Waste to Energy	Kerawalapitiya WtE- Aitken Spence (Pvt) Ltd. - In operation, PPPs agreement has been endorsed for WtE, Proposed WtE Facility for Gampaha District VERVE Energy (Pvt) Ltd., Proposed Pyrolysis plant by LOLC Advanced Technologies (Pvt) Ltd. Apart from that INSEE accept burnable waste from LAs & Individual Industries for co processing, GIZ Waste to Value project to establish 3 MRFs with Homagama PS, Gampaha PS.

2.3.5. Forestry sector

The Forestry sector currently functions as a significant carbon sink, removing 3,712.8 Gg CO₂-eq in 2021, primarily through cropland and forestland. The country has set ambitious targets for 2030, including increasing forest cover to 32%, improving 278,000 hectares of growing stock, protecting 10 major river catchments and establishing 7 million trees outside forests.

Projections show two distinct pathways: with additional measures, carbon removals could increase to -4,033.0 Gg CO₂-eq by 2030, while without interventions, removals might decrease to -3,527.8 Gg CO₂-eq. To achieve the enhanced scenario, Sri Lanka has implemented specific programs, including reforestation (targeting 2,160 Gg CO₂-eq reduction), forest restoration (12,000 Gg CO₂-eq reduction) and catchment protection (1,500 Gg CO₂-eq reduction).

Implementation parameters include increasing annual reforestation rates to 2,000 hectares per year, maintaining tree survival rates at 85%, and planting 400,000 trees annually outside forests. While some targets are currently behind schedule, the country established a comprehensive monitoring framework based on IPCC guidelines and coordinates efforts across multiple government agencies. This structured approach, combined with clear targets and monitoring systems, positions Sri Lanka to potentially enhance its carbon sink capacity by approximately 505.2 Gg CO₂-eq by 2030 compared to the business-as-usual scenario. Table 2.12 shows the NDC progress in the Forestry sector.

2.3.6 Agriculture Sector

Table 2.13 provides an update on the progress made in implementing NDCs in the agricultural sector. While most of proposed NDCs have been initiated, progress remains limited. Achieving the desired outcomes requires proper monitoring and follow-up programs. GHG emissions in the agricultural sector are primarily driven by enteric fermentation, rice cultivation and agricultural soil management practices. By adopting best practices in livestock management and precision farming technologies, these emissions can be effectively controlled, contributing to the achievement of 2030 target.

Table 2.12: Progress made in implementing and achieving the NDC in the Forestry sector

Activities / Sub Activities	Implementation Responsibility		Key Performance Indicator (KPI)	Means & Source of Verification	Baseline	Target	Progress 2021-2023
	Lead Agency	Other Key Agencies					
NDC 1: Increase Forest cover of Sri Lanka up to 32% by 2030							
1.1: Identify land for reforestation/forestation	FD	MoWL&FC, MoPla, RRI, Rubber Development Authority, LUPPD, MASL, Private sector, NGOs	1. Land area suitable for reforestation/forest restoration 2. Land use plan for DS Divisions	Maps of FD	From the Government funds FD annually plants 2000 ha of forests. Similarly, MASL plants 273 ha yearly	18,000 ha land coming under FD, 315 ha outside FD from Ministry of Plantation, 2735 ha from the MASL, Land use plans prepared for all DS Divisions	18,000 ha of sustainable lands identified for restoration
1.2. Develop forest management plans for natural forests to ensure sustainable management	FD	MoWL&FC	Number of management plans prepared	Approved management plans of FD	70	500 (60 to 76 plans per year from 2021 to 2026)	271 management plans already developed
NDC 2 – Improve quality of growing stock of natural forests and plantations							
2.1.1. Preparation of a Degradation Index	FD		Degradation Index	FD Report	0	Degradation Index prepared	Preparation of Degradation Index work 85% is completed
2.1.4. Implementation of restoration plans for identified 200,000 ha (25 plans)	FD, DWC	MoWL&FC, Divisional Secretaries, Academia	Land extent/area covered by restoration plan.	FD's progress reports (Annual)	0 ha	200,000 ha (30,000 ha per year from 2024 to 2030)	1,073 ha of degraded forest lands were reforested and 852.4 ha of degraded lands reforested as commercial plantations.
2.1.5. Completion of boundary demarcation of state-owned natural forests	FD, DWC	MoWL&FC	Extent of natural forest land demarcated	FD's progress/administrative reports (Annual)	500 km	9,840 km to cover 500,000 ha	36,229 boundary posts erected along forest boundaries and 1,668.68 Km length have been demarcated.
2.1.6. Conservation to increase non-carbon benefits (to be reported as a co-benefit)	FD and DWC	CEA, MoE, Academia	The savings from improvement of ecosystem services from forest conservation	Research reports of FD, DWLC and Academia	Some studies have been carried out in areas like valuation	At least one research to be conducted	one research article had been published by the FD Research articles on non-wood forest products submitted for publication

2.1.7. Declare all forests as protected areas under the Forest Ordinance and flora and fauna ordinance	FD	MoWL&FC	Area declared (ha)	Records of FD, DWC	The existing protected area extent (14.2% of the land area of the country)	200,000 ha (40,000 ha per year from 2021 to 2027)	99 Forests have been declared as reserve forests.
2.1.8. Sensitive areas that cannot be declared as protected areas will be managed as Environmental Sensitive areas (ESA) under ESA policy	MoE	CEA, FD	Area declared (ha)	Annual reports of CEA	The existing extent of the ESAs (116.83 km ²)	All sensitive Areas, No target but would declare based on the need	EPA Pansalathenna having the extent 103.4 ha was declared.
2.2.2. Develop plantation management plans to bring them into sustainable management & implementation (4management plans: Teak, pine, Eucalyptus and Khaya), (Khaya species management plan to be developed. Others need updated).	FD	MoPla	Number of plans developed	FD's species management plan	One for Teak	4 plans	Pinus management is being developed.
NDC 3 - Strengthen catchment protection of major rivers and cascade systems of Sri Lanka							
3.1. Multi hazard prioritization of catchment/ river basins	MASL, ID	FD, DWC	No of catchments in which multi hazards had been prioritized	MASL annual reports	0	4	Kotmale, Polgolla, Victoria, Randenigala, and Rantembe Catchments were identified.
3.2.2. Implementation of protective measures through community-based tree planting campaigns at selected locations of rivers	MASL, ID	DoA, DAD, FD, DWC	Number of plants	Records of MASL, ID	0	1 million plants	202,550 plants had been planted.
3.3.1. Mahaweli (Upper catchment) – tree planting	MASL	DoA, FD, DWC	Extent in ha, Number of plants	Records of MASL, ID	3,211 ha and 3.2 million trees from 2015 to 2020 (on the basis of 1 ha- 1,000 trees used by MASL)	2 million plants in 2,000 ha (Around 200 ha per year - 200,000 trees)	50,000 had been planted in Upper Mahaweli Catchment.
3.3.4. Tree planting in riverine areas of all rivers	MoIrri, MASL	CEA, ID, RPC, DWC, FD, MASL, UNDP-SGP Divisional Committees	Number of ha developed	Annual progress reports of MoE	10 rivers	103 rivers	10 river catchments had been planted.
3.4.1.1. Major tanks (Mahaweli- 19 excluding those in PAs, Other under ID - Major 73 & Medium - 160)	ID, MASL	DWC, FD, DAD	Number of Plans	Records of MASL, ID	3	4	Catchment management plan for UMC

3.4.1.3. Major & minor tanks under CEB (Kotmale, Kukulu, Samanala Wewa, Nillamba, /Castlerey Canyon tanks) & NWSDB (3 tanks)	CEB, NWSDB	FD, DWC, MASL	No of plants	Records of CEB and NWSDB	10,000	1,000,000 plants	25,000 plants planted
3.4.1.4. Preparation of catchment management plan/s within protected areas	FD, DWC, CEA	ID, MASL, DAD	Number of Plans	Records of FD, DWC, CEA	3 plans available	4 (excluding the target in 3.4.1.1.)	3 plans were implemented
3.4.2.2 Implementation of catchment management plan/s within protected areas	FD, DWC, CEA	ID, MASL, DAD	Number of Plans	Records of FD, DWC, CEA	0	3	CEB had planted 22,000 in reservoirs' catchments as per the 3 plans
NDC 4 - Improvement and increase of Trees Outside Forests (TROF)							
4. Improve and increase of TROF (tree planting along roadside, Urban forestry, religious lands, schools and other government lands, home gardens)	FD	RDA, UDA, MASL, DoA, DSs, DSDs, LAs Individuals, CBOs, NGOs,	The number of tree plants planted outside forests	Records of FD, RDA, UDA and other relevant organizations	100,000	1,000,000	3568 tree planting programs, 26,076 home gardens and 20 Urban Forestry
4.1. Adopt policy instruments and regulations supporting TROF (urban forestry, tree planting along roadside, religious premises, schools and other Government lands, home gardens)	MOE	MoE, MoPla, FD, Provincial councils, LAs, RDA, UDA, MASL, RPC, DoA, DAD	Policy instruments & regulations	Annual records of the stakeholder institutions	Forestry Master Plan In progress	Policy instruments and regulations supporting TROF established	Forestry sector master plan is completed.
4.2. Establish an institutional setup and a mechanism to implement such programmes	MOE	MoE, MoPLA, FD, PCs, LAs, RDA, UDA, MASL, RPC, DoA, DAD	institutional setup and a mechanism	MOE	0	institutional setup and a mechanism to implement such programmes established	Forest Department already has an internally established institutional setup/mechanism to implement the outside tree planting programme.
4.4. Implementation of TROF Programmes 4.4.1. Mobilizing public sector agencies to implement TROF Programmes. 4.4.2. Promote private companies to investment in TROF programmes through CSR programs	FD/ MoInd	NCPC, SCP & Service Providers of WM, CIAs, Academia	Percentage of industries invested in tree planting and the extent of trees planted by private sector	Records of MoInd and other private sector companies who had invested in tree planting. Records of relevant public sector institutions who engaged in tree planting	500 ha/yr	1. At least 50% from public sector agencies to adopt tree planting 2% relevant industries adopting tree planting	866,570 plants planted in 2,286 tree planting programs.
NDC 5 - Generic enabling activities							
5.1. Develop and implement a MRV system for forestry NDCs	MoE (CCS)	MoPla, FD, DWC,	MRV System	Records of MoE database	0	MRV System developed and established	Forest Cover map preparing is initiated

Table 2.13: Progress made in implementing and achieving the NDC in the Agriculture sector

NDC Activities	Implementation Responsibility		Key Performance Indicator (KPI)	Means & Source of Verification	Baseline	Progress 2021 - 2023
	Lead Agency	Other Key Agencies				
NDC 1 - Reduce post-harvest losses and value addition of fruits and vegetables.						
1.1 Planning of cultivation management	MoA	DoA, DAD, ID, MD, PDoA, MASL, DS	Planning process to avoid seasonal gluts in production	Records of MoA, DoA, MASL, DAD, DAC meeting agenda and minutes	Existing planning process, but with limited emphasis on seasonal gluts in production	Process is adopted and implemented with frequent updates from 20% to 35%
1.2 Improve post-harvest management	NIPHM	MoA, DoA, PDoAs, MASL, DAD, Academia	% of Postharvest losses for fruits and vegetables (F&V), Database for PH stats, No. of technologies disseminated through research, No. of beneficiaries of the technology transferred annually	Records of MoA, DoA, NIPHM, MASL, Private sector	Post-harvest loss of F&V 35% No compiled data To be identified disseminated technologies & beneficiary group	1. Some F&V losses are reduced by up to 20% but need to expand loss reduction for all F&V 2. About 20% of value chains are studied 3. About 15 invented technologies are disseminated among farmers 4. Technology transferred about 5000 beneficiaries
1.3 Managing excess production	MoA	EDB, ITI, IDB, Private sector, NIPHM, Food Promotion Board, DoA	% excess production with value addition/ repurposing, No. of modern technologies and processes popularized/adopted, No. of private/public sector businesses / entrepreneurs established	Records of EDB, IDB, NIPHM, DoA	There are improved technologies developed, but the level of popularization to be identified	20% of the agri produce value added, about 15 new technologies adopted, about 10 businesses / entrepreneurs established
1.4 Product innovation	MoA	EDB, ITI, IDB, Private sector, NERDC, NIPHM DoA, Academia	No. of innovative technologies developed, % No. of innovations transferred	Records of MoA, DoA, NIPHM, EDB, ITI, IDB, NERDC, NIPO	Developed innovative technologies and % of transferred technologies	About 10 technologies were developed, 15% of developed innovative technologies transferred

1.5 Monitoring of post-harvest management process	MoA	MoTrad, ICTA, SLT, DAD Economic centers, DCS, DSs, Economic centers, Private Communication on systems	Mechanism to measure PH losses, Digitized supply & value chain	Records of MoA	Present mechanism with limited scope and study on Main supermarket chains	No proper Mechanism to measure PH losses and need to digitize supply & value chain for supermarket chain and other value chain
1.6 Introduce policy and other support instruments	MoA	MoE, MoTrad, DoA, NIPHM, CARP, MASL	National Agriculture Policy (NAP), Number of personnel trained, Percentage of Reduction of PH losses	Policy, Records of MoA, NIPHM, MoTrad, CARP, HARTI	Draft NAP developed. Baseline No. of trained people and need to minimize post-harvest losses	NAP is being operationalized. Trained person about 10000/yr (NIPHM), Need to be reduced and most of the F&V losses about 20-25%
NDC 2 - Increase in crop productivity						
2.1 Identify crops with high productivity improvement potentials	DoA	MoA, MoPlant, PMoA	List of crops-species and varieties with high productivity identified and promoted	DoA data sources	Available list	LD 376, BG 377, AT 378, BG 381 (IP) rice varieties were developed, new vegetables varieties also developed by DoA
2.2 Adopt Good Agricultural Practices as a mandatory requirement in productivity enhancement programs of food crops.	MoA	DoA, MoPlant, MASL, PDoA	Production per unit area, Number of farmers certified for GAP., Land extends under GAP, Number of programs	Annual performance reports and other records of MoA, DoA, PDoA, DSC,	Present productivity levels Present certified farmers Present land extent Present programs	Productivity is not at the expected level, about 205 rice farmers adopted and 571 other field crops farmers adopted GAP, Land extent under good agricultural practices increase. Many programs conducted specially for vegetable farmers
2.3 Increase rice / paddy sector land-use productivity (paddy yield t/ha) by 10% unconditionally and 5% conditionally	DoA	MoA, ID, MASL, PDoA, RRD, DAD	Average paddy productivity/y yield (t/ha sown)	DoA data sources	4,670 kg/ha	According to the available data productivity has not increased up to the expected level due to fertilizer issue in the country (4.57 & 4.13t/ha respectively).
2.4 Improve fertilizer use-efficiency by 10% unconditionally and 5% conditionally	MoA	DoA, National Fertilizer Sec (NFS), ID, PDoA, Private sector, MASL	No. of farmers adapt site-specific fertilizer application, Percentage improvement in Fertilizer usage efficiencies (Production per kg of fertilizer use)	DoA data source		Fertilizer usage efficiencies improve through Site-specific fertilizer applications for Major crops paddy, Tea, rubber, coconut, etc. Initiated and need to operationalize. Site specific maps and mobile app were developed at the level of GS division for some soil parameters.

2.5 Improvement of water use efficiency	DoA	MoA, MoIrri (IMD), ID, PDoA, MASL	Increase water productivity in all crops	Data sources of DoA, ID, MoIrri (IMD)	To be identified 0.31 kg/m ³	Observed in 0.3 and 0.28 kg/m ³ respectively in 2021 and 2023 for paddy cultivation through AWD.
2.6 Promote precision agriculture	DoA	MoA, PDOAs MASL, Academia, Private sector	Promotional programs conducted, Number of capacity building programs conducted, Characterization of technologies, Introduce the concepts into formal educational programs, Number of pilots demonstration projects implemented	Data sources of DoA, MoA, DAD, MASL		Concept of Precision Agriculture was initiated but needed to enhance technologies to apply at field levels. Agricultural information mapping with database to take correct decision at field level with variable rate application needs to be operationalized. Mechanization in agriculture in land preparation -100% Liquid Chromatography Chemical application-90% Harvesting -90%
NDC 3 -Improve adoption of renewable energy for crop farming/value addition						
3.1 Application of solar PV and wind energy (or hybrid) for agriculture practices	MoA	DoA, SLSEA, CEB, MASL, DAD, PDoA, Private sector	Percentage of solar PV powered water pumps	SLSEA, DoA data sources	2% of farmers	5% Out of electricity operated pumps in 2021
3.2 Renewable energy powered mini grid for clustered agriculture farming in vulnerable areas	SLSEA	MoA, PDoA	Pilot scale study	SLSEA data sources		The following projects initiated; 20 kW rooftop solar PV system, 2 kW small wind turbine, 50 kWh battery storage system, AI system implemented through cloud-based software, Interest of Things sensors, including smart meters for real-time measurement and control,
3.3 Explore the potential to develop small hydro power potential in irrigation water canals for agriculture purpose	ID	MoA, SLSEA, CEB, DoA, MASL	Report on potential with recommendations	SLSEA data sources		Studied potential with recommendations. Need to be initiated
NDC4 - Improve dairy sector productivity by managing herd, herd health, feed and by improving animal comfort and welfare						
4.1: Improve herd management	DAPH	PDAPHs, NLDB, LAs, MASL, Academia, Private Sector	Percentage increase of productive animals, increase of milk production per animal, Decrease number of AI per Conception, Number of new breeds introduced	Records of DAPH	45% productive animals (end 2020)	Productive animals observed as 55% in 2023. Average of 25% of improved breed population out of total cow population, Average milk yield in 3.3 l/day/head (semi-intensive system 5.1 l/day/cow & 22 l/cow/day of milk), current AI (Artificial Insemination) rate 3.5,

						AI programs introduce across the regions.
4.2: Improve feed management	DAPH	PDAPHs, NLDB, MASL, Academia, Private Sector	Extent (ha) with improved varieties Number of varieties	Records of DAPH	10,000 ha 3-4 varieties	2 grass varieties - CO-5 - Hybrid Napier Varieties •Mulato – II Brachiaria hybrid variety 20,699 acers with improved varieties
4.3.: Herd Health Management	DAPH	PDAPHs, NLDB, MASL, Academia, Private Sector	Percentage reduction of incidences of Mastitis reported	Records of DAPH	Percentage of incidence s reported - 25%	Mastitis 8.21% reduction of total reported number of cases in 2023 than 2022.
4.4: Improve animal comfort and animal welfare	DAPH	PDAPHs, NLDB, Academia, Private Sector	Increase of number of improved sheds	Records of DAPH		Currently initiated in Ambewela Dairy farm. Need to be initiated in other farms.
NDC 5: Improve productivity of Monogastrics by improving genetic, feed efficiency, animal health, comfort and welfare						
5.1: Genetic improvement	DAPH	PDAPHs, NLDB, MASL, Academia, Private Sector	Increase of carcass weight Increase of hen house (egg) production Increase of feed conversion efficiency	Records of DAPH		Improved population of Poultry- 82% Data is only available in publications and needs established a proper way for data collection throughout the sector.
5.2: Improve feed quality	DAPH	PDAPHs, NLDB, MASL,	Percentage of registered feed manufactures Percentage of registered animal feed quantity from the total	Through field level sample surveys under the Animal Feed Act		Commercial feed production in 2023 995,260 MT for poultry feed 4,540 MT for Swine 70 MT for Goat
5.3: Animal health management	DAPH	PDAPHs, VRI, Academia, Private sector	Reduction of number of cases (ND & IBD for poultry, Pasturellosis for Swine), Reduction of mortality rate for major disease Number of vaccinations done (with local New Castle Disease Virus)	Records of DAPH		In 2023, Fowl fox reduces by 24.89% reduction of total cases than 2022. Gamboro (Infectious Bursal Disease)-72.53% reduction of affected birds' number. Newcastle disease- 7.93% decrease of total disease incidence when compared to 2022.
5.4: Improve animal comfort and animal welfare	DAPH	PDAPHs, NLDB, Academia, Private sector	The percentage increase of birds under environmentally controlled housing.	Records of DAPH		Initiated in famous poultry farms Need to be initiated for other monogastric.
NDC 6 - Adopt renewable energy for livestock applications						
6.1: Introduce small-scale solar powered refrigeration facilities to increase the milk storage	DAPH	DAPH, PDAPHs, SLSEA,	Increase of milk quality and quantity collected	Records of DAPH, SLSEA, CEB	Baseline to be established in 2023 in	In Ampara District, the PV system helps Livestock and Dairy Farmers Co-

facilities. Introduce Solar PV Powered Can Coolers for Milk Producers [already commenced by MILCO]		Private sector, Adoptive rate of the intervention			consultation with SLSEA	op Society Ltd. by making the milk chilling process more cost-effective.
6.2: Introduce Solar PV energy for milk collection & chilling centers	SLSEA	DAPH, PDAPHs, CEB,	Milk processors, Solar power suppliers, Financiers, kW of solar PV installed, Number of installations, Number of installations with full grid independence, Increase of milk collection.	Records of SLSEA	Baseline to be established in 2023 in consultation with SLSEA.	Fonterra 32 solar panels with a 3.24 kW capacity.
6.3: Introducing solar energy for farm operation and processing	SLSEA ,	DAPH, PDAPHs	kW of solar PV installed Number of installations, Increase of milk collection	Records of SLSEA	Baseline to be established in 2023 in consultation with SLSEA	Agrivoltaics are built on tea plantation. Solar PV system generates enough energy to power the containerized cold rooms.
6.4: Introduce generation of biogas in large scale livestock & poultry, dairy processing, and abattoirs	SLSEA	DAPH, PDAPHs, CEB, CEA, LAs, Private sector	Capacity (m3) of biogas plants established, Number of installations	Records of SLSEA	Baseline to be established in 2023 in consultation with SLSEA.	High potential utilizes in the food processing industry (Crop & Livestock)

2.3.7 Mitigation policies, measures, actions and plans related to implementing and achieving NDCs

Details of the actions planned to achieve sector-wise NDCs are outlined in the NDCs Implementation Plan 2021-2030 (MoE, 2023). This document serves as a comprehensive blueprint for the implementation of measures aimed at fulfilling Sri Lanka's sector-specific NDCs. This section summarizes the policies, measures, actions and plans related to the implementation and achievement of NDCs in Sri Lanka. They are presented in Table 2.14.

Table 2.14: Mitigation policies and measures, actions and plans related to implementing and achieving NDCs

Name	Description	Objectives	Type of instrument	Status	Sector(s) affected	Gases affected	Start year of implementation	Implementing entity or entities	Estimates of GHG emission reductions (Gg CO ₂ -eq)	
									Achieved	Expected
Enhance renewable energy contribution to the national electricity generation	Establish wind power plants	Increase installed wind power share by 865 MW (Unconditional 128 MW, Conditional 737 MW) by 2030	Technology	Implemented	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB, SLSEA	452.51	NE
	Establish rooftop and ground-mounted solar PV	Increase solar power capacity (rooftop & ground-mounted) by 2,263 MW (335 MW unconditional, 1,928 MW conditional)	Technology	Implemented	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB, SLSEA	869.85	NE
	Power generation through sustainable biomass resources	Addition of 65 MW (Unconditional 10 MW, Conditional 55 MW)	Technology	Implemented	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB, SLSEA	133.86	NE
	Establish large and	Addition of Large Hydro: Unconditional 31	Technology	Implemented	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB, SLSEA	31.25	NE

	small hydro power plants	MW. Mini Hydro: Unconditional 20 MW, Conditional 110 MW (Total Mini Hydro 130 MW)		by end of 2023						
Infrastructure development for renewable energy integration	Develop the required transmission network infrastructure to enable integration of renewable energy	Length of network infrastructure developed/upgraded, Extend by 480 km. (Could be a very elaborate target under REDMAP)	Infrastructure	Extended the transmission network infrastructure by 92 km	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB	NE	NE
Implement DSM measures by promoting energy efficient equipment, technologies, & system improvements	Realize energy saving of 2,603 GWh by phasing out incandescent bulbs as an unconditional measure	Realize energy saving of 5,189 GWh by introducing efficient lighting, fans, refrigerators, and chillers as a conditional measure	Technology	Achieved 634 GWh energy saving through DSM activities during 2021-2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, SLSEA	437.5	NE
T&D network efficiency improvements	Upgrade networks, re-conductor existing lines, and implement reactive power compensation.	Loss reduction of 0.5% compared with BAU by 2030) as unconditional measures (Target – Approximately 1,848 GWh energy savings (2021-2030)	Technology	Saved 714 GWh through T&D network efficiency improvements (2021-2023).	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB	437.5	NE
Continue fuel-switching to sustainable	Convert furnaces to steam boilers and	to convert 90 units by 2030	Technology	implemented 19 units by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoI, SLSEA, SLTB, TRI, CIAs	NE	NE

biomass energy and improve user efficiency in selected industrial sub-sectors	hot-water systems.									
	Replace fossil fuel-fired thermal energy with biomass systems in government institutions.	To install 190 hot water systems by 2030	Technology	Implemented 19 units	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB, SLSEA	NE	NE
Enhance the application of Resource Efficient Cleaner Production (RECP) practices in selected industrial sub-sectors	Adopt resource-efficient, low-carbon technologies and processes.	Adopting RECP practices and acquiring low carbon technologies and processes in 500 industries	Technology	Implemented EE Projects by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MOI, NCPC, IDB, ITI and service providers	NE	NE
	Installing HEM for water sector.	To save 7 GWh of electrical energy per year	Technology	achieved energy saving of 1.4 GWh by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	NWSDB, SLSEA	0.97	NE
	Replace inefficient chillers with energy-efficient alternatives.	To save 170 GWh of electrical energy by end of 2030	Technology	Installed 11 chillers by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB	NE	NE
Establish eco-industrial parks and villages	Transform parks by integrating maximum green industrial concepts.	to transform 3 BOI IPs and 50% of Non-BOI IPs into ECO IPs by end of 2030	Technology	UP graded the WWT plants in 4 BOI parks, Planted 1900 Trees	Energy, Waste, Agriculture	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, SLSEA	NE	NE
Introduce tri-generation facilities to selected	Conduct rapid potential assessments in 10	Rapid assessment completed for tri generation potential in 9	Technology	Completed rapid assessment in potential for tri	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB	NA	NA

industrial parks	industrial parks.	industrial Parks by the year 2024		generation in 4 industrial parks						
Introduce NDC support policy tools and instruments	Support industries in adopting ISO systems focused on reducing GHG emissions.	25% of industries adopting various ISO system having focus on GHG reduction such as ISO 50001 and ISO14064-1 by end of 2030	Policy	127 of industries have adopted various ISO system on GHG reduction by 2030	Energy, Waste	CO ₂ , CH ₄ , N ₂ O	2021	MOI	NE	NE
	Ensure continuous biomass availability for industrial applications.	To have access to sustainable biomass to all the relevant industries	Policy	5 industries certified for sustainable biomass	Energy	CO ₂ , CH ₄ , N ₂ O	2021	SLSEA, FD	NE	NE
GHG reduction of clinker production in the cement industry	Reduce GHG emissions by avoiding clinker production.	To reduce GHG emission in Clinker production	Technology	Reduced use of clinker in production of cement by replacing clinker with 319172 tone of fly ash by end of 2023	IPPU	CO ₂ , CH ₄ , N ₂ O	2021	MOI, SLSI, Cement Industries	No reduction. Replacement results the reduction of clinker imports	NE
Enteric Fermentation	Improve feed quality, breeds, and practices to reduce CH ₄ emissions.	Measure to reduce GHG emissions in agricultural soils (CH ₄ emission)	Law / Standard, Subsidy, Awareness, Raising, R & D facility, Other	Initiated	Agriculture/ Livestock	CH ₄	2021	DAPH, PDAPHs, NLDB, MASL, Academia, Private Sector	2,130	2047

Manure Management	Enhance storage, treatment, and application with anaerobic digestion technologies .	Measure to reduce GHG emissions in agricultural soils (CH4 emission)	Law / Standard, Subsidy, Awareness, Raising, R & D facility, Other	Initiated	Agriculture /Livestock	CH ₄	2021	DAPH, PDAPHS, NLDB, MASL, Academia, Private Sector	190	200
Reduction of CH ₄ emissions in paddy fields	Reduce CH ₄ emissions by prolonging mid-season drainage and optimizing water management .	Measure to reduce GHG emissions in agricultural soils (CH ₄ emission reduction from rice cultivation)	Law / Standard, Subsidy, Awareness, Raising, R & D facility, Other	To be Implemented	Agriculture/ Crop	CH ₄	2021	MoA, DoA, PDoAs, MASL, DoI, Academia	1,784	2052
Reduction of nitrous oxide associated with fertilization	Minimize N ₂ O emissions through reduced, split, or slow-release fertilizer and precision farming.	N ₂ O emission reduction associated with fertilizer application	Law, Subsidy, Awareness, Raising	To be Implemented	Agriculture/ Crop	N ₂ O	2021	MoA, DoA, PDoAs, DoI, MASL, TRI, RRI, CRI, Academia	303	
Direct and Indirect emission from managed soil	Combine precise nutrient management , improved irrigation, conservation practices, and innovative technologies	N ₂ O emission reduction associated with soil management in crop lands	Subsidy, Awareness, Raising, R & D facility for improving innovative Technology	To be initiated	Agriculture/ Crop	N ₂ O	2021	MoA, DoA, PDoAs, DoI, MASL, TRI, RRI, CRI, Academia	1,958	2128

Field burning of biomass	Utilize regulatory measures, sustainable residue management, technological interventions, and community engagement.	Control CO ₂ , N ₂ O & CH ₄ by preventing burning of biomass	Law/Standard, Subsidy, Awareness, Raising, R & D facility, Other	Implemented	Agriculture	CO ₂ , CH ₄ , N ₂ O, CO	2021	MoA, DoA, PDoAs, MASL	473	540
Reforestation and Afforestation Program			Regulatory and Economic	Adopted	LULUCF	CO ₂	2021-2030	Department of Forest Conservation, MASL, Regional Plantation Companies	NE	NE
National Policy on Waste Management (2019)	Encompasses all waste categories aims to establish a stable, sustainable system under one framework, completing material cycles aligned with the circular economy.	To provide coherent and comprehensive directions for waste management in the country covering all forms of wastes to meet the acute short-term challenges in line with medium- and long-term sustainable solutions up to 2030 with entrusted accountability.	Policy	Implemented	Waste	CO ₂ , CH ₄ , N ₂ O	2019	MoE	NE	NE

National Action Plan on Plastic Waste Management 2021–2030	Prepared based on a preventative approach and using 3R related waste hierarchy.	To assist in achieve the policy’s vision – enabling a “Healthy life and Cleaner Environment for all”.	Policy	Implemented	Waste	CO ₂ , CH ₄ , N ₂ O	2021	MoE	NE	NE
Western Province Solid Waste Management Master Plan in Sri Lanka (2021-2042)	To fill the gaps in management of solid waste by formulating an evidence-based solid waste management plan.	To manage solid waste by formulating an evidence-based solid waste management MP that encompasses medium- to long-term forecasts and a range of proposed solutions to the waste problems.	Master plan	In progress	Waste	CO ₂ , CH ₄ , N ₂ O	2021	WPWMA	NE	NE
Guidelines for Safe Closure and Rehabilitation of Municipal Solid Waste Dumpsites in Sri Lanka (2021)	To support local authorities to help reduce pollution risks on the environment and public health at the local level.	To provide guidance on safe closer and management of dumpsites	Guideline	In progress	Waste	CO ₂ , CH ₄ , N ₂ O	2021	MoE	NE	NE
Environmental Protection Licensing	A regulatory/legal tool under the provisions of the National Environment Act No. 47	To regulate industries/ activities in terms of the environmental impact they could create.	Regulatory	Implemented	Waste	CO ₂ , CH ₄ , N ₂ O	1990	CEA	NE	NE

	of 1980 as amended by Acts No. 56 of 1988 and No. 53 of 2000.									
Transport Sector System Improvement	Avoid the need to travel through ICT applications	Reduce travel demand and emissions	Policy and ICT Initiative	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	Ministry of Trade, Ministry of Public Administration, ICT Agency	NE	NE
	Reduce commuting distances and travel times	Improve urban mobility and reduce emissions	Urban Planning	Ongoing	Transport, Urban Development	CO ₂ , CH ₄ , N ₂ O	2021	UDA, LAs	NE	NE
	Improve traffic and traffic light management	Reduce congestion and fuel consumption	Traffic Management	Piloting	Transport	CO ₂ , CH ₄ , N ₂ O	2021	MOT, RDA	NE	NE
	Improve parking management	Reduce vehicle travel, idling and emissions	Parking Facilities	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	MOT, Local Councils	NE	NE
	Introduce intelligent transport management systems	Optimize public transport operations	Digital Infrastructure	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	MOT, Private Sector	NE	NE
	Enhance road architecture to improve public transport	Improve safety and traffic flow	Infrastructure	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	RDA, Provincial Road Authorities, MOT	NE	NE
	Promote Public Passenger Transport	Improve public road transport	Increase public transport ridership	Infrastructure and Policy	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	NTC, SLTB, MOT	NE
Enhance railway transport		Increase rail usage and efficiency	Infrastructure	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2021	SLR	NE	NE

	Integrate transport modes	Improve connectivity between public transport modes	Policy and Infrastructure	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2021	MOT	NE	NE
	Improve last-mile connectivity	Promote sustainable travel options for last-mile access	Policy and Infrastructure	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2021	MOT, NTC, Provincial Road Transport Authority	NE	NE
Shift Freight to Efficient Modes	Promote rail freight transport	Shift freight from road to rail	Policy and Infrastructure	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	SLR	NE	NE
	Develop pipeline transport	Reduce road freight emissions	Infrastructure	Planned	Energy, Transport	CO ₂ , CH ₄	2021	CPC	NE	NE
	Develop rail-based inland container depots	Reduce long-haul road freight	Infrastructure	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2021	SLR	NE	NE
Promote NMT Modes	Promote bicycle use	Increase active transport and reduce emissions	Infrastructure and Policy	Ongoing	Transport, Urban Development	CO ₂ , CH ₄ , N ₂ O	2021	UDA	NE	NE
	Improve pedestrian walkways	Enhance accessibility and promote walking	Infrastructure	Ongoing	Transport, Urban Development	CO ₂ , CH ₄ , N ₂ O	2021	UDA, Local Authorities	NE	NE
Introduce Taxes and Instruments to Promote Public Transport	Reform vehicle emission charges	Discourage high-emission vehicles	Regulatory	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2026	DMT	NE	NE
	Levy charges on private vehicles	Reduce congestion and emissions	Regulatory	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2026	Local Councils	NE	NE
	Develop "Park & Ride" systems combined	Encourage public transport usage	Infrastructure, Regulatory	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2026	UDA	NE	NE

	with Cordon based pricing mechanism									
Introduce Inland Water Transport	Establish canal-based water transport	Reduce road traffic and emissions	Infrastructure	Not commenced	Transport	CO ₂ , CH ₄ , N ₂ O	2026	MOT, Private Sector	NE	NE
Modernize and Upgrade Suburban Railway	Expand existing railway lines	Increase rail connectivity	Infrastructure	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2026	Sri Lanka Railways	NE	NE
Promote Electric and Hybrid Vehicles	Increase tax concessions	Promote low-emission vehicle adoption	Fiscal Incentives	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	Ministry of Finance, DMT	NE	NE
	Develop EV infrastructure	Expand charging networks	Infrastructure	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	MOT	NE	NE
Improve Vehicle Fleet Efficiency	Enhance vehicle inspection systems	Reduce emissions from inefficient vehicles	Regulatory	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2025	DMT	NE	NE
	Promote fuel-efficient vehicle imports	Encourage vehicles with higher fuel efficiency	Fiscal Policy	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2025	Ministry of Finance	NE	NE
	Introduce eco-driving programs	Promote fuel-efficient driving practices	Awareness and Training	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2022	DMT	NE	NE
Road Infrastructure Development	Upgrade provincial and rural roads	Improve connectivity and reduce emissions from inefficient routes	Infrastructure	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	RDA, Provincial Road Authorities	NE	NE
	Expand the expressway network	Improve transport efficiency and reduce congestion	Infrastructure	Ongoing	Transport	CO ₂ , CH ₄ , N ₂ O	2021	RDA	NE	NE
Reduce GHG Emissions	Ratify Annex VI of the	Enforce international	Policy and Regulation	Planned	Transport, Marine	CO ₂ , CH ₄ , N ₂ O	2024	Ministry of Ports and Shipping	NE	NE

from the Marine Sector	MARPOL convention	standards for marine emissions								
	Promote sea transportation	Reduce road traffic and emissions	Infrastructure	Planned	Transport, Marine	CO ₂ , CH ₄ , N ₂ O	2024	Ministry of Ports and Shipping	NE	NE
	Introduce energy efficiency programs for vessels	Improve energy efficiency and reduce fuel consumption in marine vessels	Capacity Building, Technology Upgrade	Planned	Transport, Marine	CO ₂ , CH ₄ , N ₂ O	2024	Ministry of Ports and Shipping, SLPA	NE	NE
Generic Enabling Activities	Develop policies to support sustainable transport	Establish a comprehensive framework for low-emission, sustainable transport initiatives	Policy Development	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2025	MOT, CCS	NE	NE
	Introduce a fuel-based carbon tax	Discourage excessive fuel use and promote fuel-efficient practices	Fiscal Policy	Planned	Transport	CO ₂ , CH ₄ , N ₂ O	2025	Ministry of Finance	NE	NE
	Include climate change measures in maritime policies	Integrate GHG mitigation and climate resilience into maritime transport strategies	Policy and Regulation	Planned	Transport, Marine	CO ₂ , CH ₄ , N ₂ O	2026	Ministry of Ports and Shipping	NE	NE
Continue fuel-switching to sustainable biomass energy and improve user efficiency in selected industrial sub-sectors	Convert industry furnaces to steam boilers and hot-water systems	To convert 90 units by 2030	Technology	Implemented 19 units by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoI, SLSEA, SLTB, TRI, CIAs	NE	
	Switching fossil fuels fired thermal energy generators to biomass	To install 190 hot water systems by 2030	Technology	Implemented 19 units	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB, SLSEA	NE	

	energy in government institutions by installing hot water systems									
Enhance the application of RECP practices in selected industrial sub-sectors	Adopt RECP practices including low carbon technologies and processes	Adopting RECP practices and acquiring low carbon technologies and processes in 500 industries	Technology	Implemented EE Projects by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MOI, NCPC, IDB, ITI and service providers	NE	
	Installing HEM for water sector	To save 18 GWh of electrical energy per year	Technology	achieved energy saving of 1.4 GWh by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	NWSDB, SLSEA		0.97
	replacement of inefficient chillers with efficient chillers and refrigeration technologies	To save 170 GWh of electrical energy by end of 2030	Technology	Installed 11 chillers by end of 2023	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB	NE	
Establish eco-industrial parks and villages	Transform existing industrial parks (IPs) incorporating maximum possible green industrial concepts	to transform 4 - BOI IPs and 50% of Non-BOI IPs in to ECO IPs by end of 2030	Technology	UP graded the WWT plants in 4 BOI parks, Planted 1900 Trees	Energy, Waste, Agriculture	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, SLSEA	NE	
Introduce tri-generation facilities to	Carry out a rapid assessment	Rapid assessment completed for tri generation	Technology	Completed rapid assessment	Energy	CO ₂ , CH ₄ , N ₂ O	2021	MoP&E, CEB	NA	

selected industrial parks	of tri-generation potential in 10 industrial parks	potential in 9 industrial Parks by the year 2024		in potential for tri-generation in 4 industrial parks						
GHG reduction of clinker production in the cement industry	GHG reduction through avoiding production of clinker	To reduce GHG emission in Clinker production	Technology	Reduced use of clinker in production of cement by replacing clinker with 319,172 tonne of fly ash by end of 2023	IPPU	CO ₂	2021	MOI, SLSI, Cement Industries		No reduction, Replacement results the reduction of clinker imports
Introduce NDC support policy tools and instruments	Facilitate industries in selected sub-sectors to adopt relevant ISO systems having a focus on GHG emissions reduction	25% of industries adopting various ISO system having focus on GHG reduction such as ISO 50001 and ISO14064-1 by end of 2030.	Policy	127 of industries have adopted various ISO system having focus on GHG reduction by 2030	Energy, Waste,	CO ₂ , CH ₄ , N ₂ O	2021	MOI	NE	NE
	Ensure the availability of sustainable biomass for industry use	To have access to sustainable biomass to all the relevant industries	Policy	5 industries certified for sustainable biomass	Energy	CO ₂ , CH ₄ , N ₂ O	2021	SLSEA, FD	NE	NE

2.3.8 Summary of GHG emissions and removals

The NIR in the BTR1 covers the period from 2011 to 2021. NDCs progress tracking was carried out from 2021-2023. The overview of the GHG emissions and removals from 2011 to 2021 is presented in Table 2.15.

Table 2.15: Summary of GHG emissions and removals in Gg CO₂-eq

Year	Energy	IPPU	Agriculture	LULUCF	Waste
2011	17,799.78	544.29	6,555	-8,457.82	596.0
2012	19,179.46	573.41	5,865	-8,344.8	577.8
2013	15,707.22	593.57	6,143	-8,719.8	552.8
2014	18,836.68	532.30	5,689	-8,739.78	572.9
2015	19,354.35	496.42	6,344	-8,959.28	585.4
2016	21,678.97	553.42	5,489	-8,764.29	595.5
2017	24,342.37	490.67	5,164	-9,221.16	606.3
2018	22,656.76	472.46	5,507	-8,987.36	620.4
2019	23,134.44	429.71	5,641	-8,656.16	629.8
2020	21,598.28	488.70	6,575	-9,165.53	647.7
2021	21,699.90	519.29	6,070	-9,728.57	657.9

Expected GHG emission reduction in the Electricity (Power) sector during the 2021-2023 period is 7,001.5 tCO₂-eq (Figure 2.3). Actual emission reduction from quantifiable policies and measures implemented during the same period is 2,419.4 tCO₂-eq according to the estimations. The respective emissions reduction is outlined in the Section 2.3.1.2.

Table 2.16 presents projections of GHG emissions and removals under a 'with measures' scenario.

Table 2.16: Information on projections of GHG emissions and removals under a “with measures” scenario

Sector	Most recent year in the Party’s national inventory report (Gg CO ₂ -eq)		
	2021	2025	2030
Energy	7,768	14,154.52	17,189.40
Transport	NE		
IPPU	519.29		
Agriculture	NE		
LULUCF sector components	NE		
Forestland	-3000	-3450	-3500
Cropland	NE	NE	NE
Grassland	NE	NE	NE
Wetlands	NE	NE	NE
Settlements	NE	NE	NE
Waste	1,214.80		
Other (specify)			

2.3.9 Projections of GHG emissions and removals

2.3.9.1 Electricity (Power) sector

Actual GHG emissions from the Electricity (Power) sector since 2013 were graphed against BAU scenario projections given with NDCs. Projected sector GHG emission was 14,650 Gg CO₂-eq and the actual GHG emission was 7,767.6 Gg CO₂-eq in 2021 which envisage 47% emission reduction against the BAU scenario. Figure 2.3 shows the GHG emission NDC projections and actual emissions in 2021 for Electricity (Power) sector.

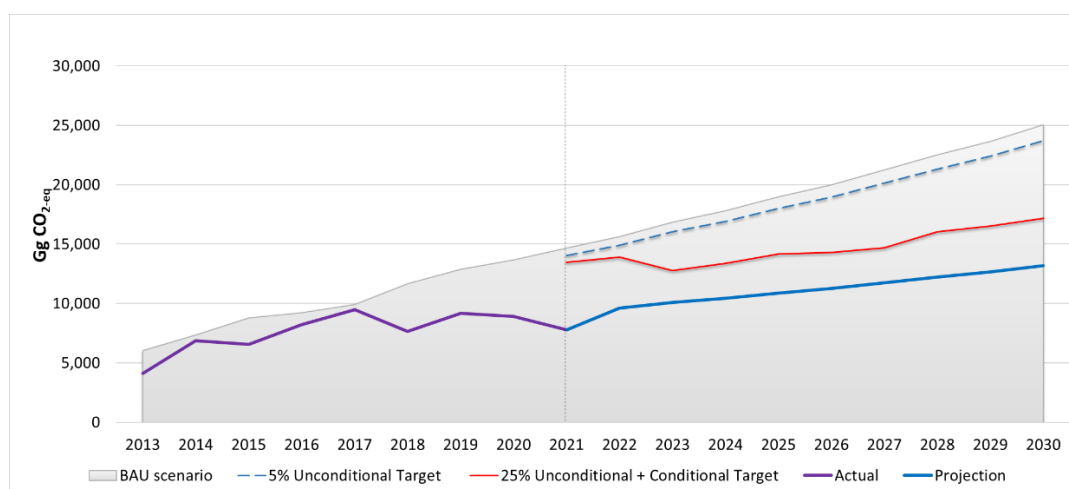


Figure 2.3: GHG emission NDC projections and actual emissions

Projections depicts current policies and measures in pipeline can support to maintain the sector emissions lower than the NDC targets by 2030.

Emission projections in Transport, Industry, Waste, Forestry and Agriculture were unable to be estimated due to a lack of comprehensive dataset availability and variation of analysed historical data doesn't reflect the actual ground scenario. In addition, due to the limited time availability for the preparation of this report, the emission projections of the above sectors are expected to be reported through BTR2.

2.4 Progress of the NDC Adaptation Sectors

The agriculture, biodiversity, coastal and marine environments, fisheries, health, livestock, tourism, urban planning and water sectors are highly affected by the Climate change impacts. Consequently, these nine sectors have been recognized in NDCs to prioritize adaptation measures by related governmental agencies, specialists, and other stakeholders in each vulnerable sector.

2.4.1 Agriculture sector

Sri Lanka has made significant progress in integrating climate change considerations into agriculture through its Nationally Determined Contributions (NDCs). Efforts include developing guidelines and inventories for Climate Smart Agriculture (CSA), promoting CSA technologies through SL GAP programs and providing climate-based agro-advisories. Notable achievements include the development of heat, drought and pest-tolerant crop varieties,

improved seasonal climate forecasting and enhancing input-efficient farming methods, such as fertigation and rainwater harvesting. Furthermore, initiatives like the restoration of tank cascades and crop diversification aim to build climate resilience. Risk management mechanisms, including agriculture insurance and early warning systems, have also been strengthened. Despite these advances, achieving full implementation requires further financial and technological support, particularly in scaling up CSA adoption, integrated pest management programs and protected agriculture technologies. These initiatives collectively enhance the resilience of Sri Lanka's agricultural sector to climate change while addressing food security and sustainability challenges.

The details of the NDC tracking are attached in Annex 22.

2.4.2 Fisheries sector

Sri Lanka has made significant progress in implementing its NDCs for sustainable fisheries and aquaculture under changing climate conditions. Key achievements include identifying priority fisheries management areas in the Kalutara to Puttalam region and developing small pelagic management plans. The development of a lobster management plan for Hambantota has been initiated, alongside the establishment of 20 fisheries management committees and gazetting 112 fisheries areas under the Fisheries Act to support sustainable practices. Additionally, the country has completed a pilot project on sea bass culture in Rekawa Lagoon, feasibility studies for aquaculture species in Thondamanaru Lagoon and implemented fish barricades in 50 perennial reservoirs to prevent fish escape during floods.

Efforts in aquaculture have led to the stocking of 71.82 million fingerlings, contributing to inland fish production of 114,850 metric tons. Cryopreservation facilities have been enhanced with advanced equipment and a climatic resilience Tilapia breeding program is underway. Lagoon conservation efforts have advanced with three lagoon profiles completed and pollution minimization initiatives initiated for Arugambay and Nanthikadal lagoons. Safety at sea has been bolstered with an SMS-based early warning system, the “Sayura” app and Vessel Monitoring Systems (VMS) installed on multiday boats. Despite funding challenges, these achievements reflect Sri Lanka's commitment to building climate-resilient and sustainable fisheries systems.

The details of the NDC tracking are attached in Annex 23.

2.4.3 Livestock sector

Sri Lanka has made notable progress in implementing climate adaptation measures in the livestock sector under its NDCs. Key achievements include the introduction of technologies such as misters, coolers, ventilation fans and sprinkler irrigation systems in large-scale dry zone farms, alongside silage conservation practices and hay baling projects to improve feed systems. Two high-yielding, climate-adaptable forage varieties were developed and introduced in two districts, meeting the target for 2023. Surveillance programs for climate-related livestock diseases, including Brucellosis in cattle and Highly Pathogenic Avian Influenza (HPAI) in poultry are actively ongoing. In aquaculture, efforts such as establishing rainwater harvesting ponds at NLDB farms in the dry zone demonstrate progress in resilience building.

Additionally, research on climate-resilient fodder varieties is advancing with one study nearing completion and support for semen imports provided to improve breeding practices. However, challenges like funding constraints and high costs have limited the implementation of gender-responsive adaptation measures and capacity-building initiatives.

The details of the NDC tracking are attached in Annex 24.

2.4.4 Water sector

NDC 1: Efforts in Integrated River Basin Management (IRBM) include vulnerability assessments and the development of water resource plans, with notable progress in the Kalu Ganga, Mee Oya and Mundeniaru basins. However, budget constraints and lack of trained engineers have slowed progress. The IRBM plans for critical river basins are behind schedule, with limited implementation due to financial challenges. Water retention and ecosystem restoration initiatives are ongoing in catchments like Mahaweli Basin.

NDC 2: Groundwater and surface water monitoring projects are progressing, with 70 new drinking water projects launched and 897 community-based projects introduced by 2023. Rainwater harvesting (RWH) systems have been installed, achieving 37% of the target. Provisional wells and groundwater recharge systems are being developed in drought-prone areas, with ongoing efforts to meet water security goals. Water quality testing and rehabilitation of water schemes are also progressing, although further funding and technical support are needed to achieve the 2030 targets.

NDC 3: The country aims to promote climate-resilient water supply schemes, including establishing real-time monitoring systems for water quality and levels in major water sources such as the Kelani River, with plans for further expansion by 2028. Progress has been made in promoting Rainwater Harvesting (RWH) systems, with over 3,700 units installed, though further targets are set for 2030. Additionally, mechanisms for providing safe drinking water during floods, droughts and saltwater intrusion have been put in place, with work progressing on disaster management plans and infrastructure.

NDC 4: NDC 4 promotes the use of treated wastewater for various purposes, including water conservation and recycling, with targets for establishing regulatory measures and increasing awareness. The implementation of these NDCs includes strengthening interagency coordination, assessing innovative water management approaches and improving monitoring systems for saline water intrusion, aiming to ensure a sustainable and resilient water supply by 2030.

NDC 5: NDC 5 addresses salinity intrusion in key rivers during drought seasons, focusing on Kelani Ganga, Kalu Ganga and Malwathu Oya. Salinity barriers are already established at Gin Ganga and Walawe Ganga, with designs for the Ambathale salinity barrier underway. The first step involves identifying the best technical and financial solutions for salinity barriers in these regions, with initial studies completed in 2020 for the Gin Ganga, Nilwala Ganga and Walawe Ganga. Additional studies for Ambathale and Kalu Ganga are expected to be completed by 2024. The next phase includes the establishment of salinity barriers at critical locations, with two barriers already installed at Gin Ganga and Walawe Ganga, and ongoing construction at Nilwala Ganga. The Ambathale salinity barrier's design is progressing, with funding support

from the World Bank under the CResMPA project. By 2028, five salinity barriers are expected to be operational, including those at Kelani Ganga, Ambathale, Kalu Ganga and Nilwala Ganga. Furthermore, efforts are underway to regulate groundwater extraction in areas impacted by salinity intrusion, with 66 sources currently regulated by the Water Resources Board (WRB), aiming to reach 40 regulated sources by 2030. Monitoring of saline water intrusion into drinking water sources is conducted daily, with real-time reports on water quality and salinity levels in the three river basins. Finally, interagency coordination is being strengthened to enhance early warning systems for salinity intrusion, with weekly meetings and ongoing efforts to improve the coordination framework. This comprehensive approach aims to safeguard water quality and availability, particularly during drought conditions, through a combination of infrastructure, regulation, monitoring and interagency cooperation.

NDC 6: The water sector in Sri Lanka is working to enhance the capacity of its institutions and personnel to build resilience to climate change. This includes identifying key gaps in knowledge related to Climate change impacts and ensuring that water safety planning (CRWSP) is integrated into training programs. By 2024, it is expected that the main capacity gaps will be identified, with a target of training 1,350 staff by 2030. Gender awareness is also being included in these assessments, although there is a lack of gender experts within the ministry. As a result, resources and expertise are required to implement effective gender-responsive training. Additionally, efforts are being made to prepare plans for building the capacity of various institutions, with the aim of conducting at least eight training programs annually and training 60 staff members each year by 2030. Awareness campaigns targeting the public for sustainable water use are ongoing, with NWSDB aiming for 329 awareness programs by 2023. Capacity building within communities and Community-Based Organizations (CBOs) is also a priority, with a focus on gender inclusivity in all training programs.

NDC 7: The restoration and rehabilitation of reservoirs and irrigation systems is crucial for enhancing climate resilience in Sri Lanka's agriculture sector. Progress has been made in prioritizing abandoned tanks and canals, with a target of restoring 50 tanks and 100 km of canals by 2030. Overachievement has been reported in restoring minor tanks, with 400 tanks restored by 2023. However, the augmentation of major and medium reservoirs has faced challenges due to the suspension of the Wari Saubhagya Program, which led to financial constraints. The construction of upstream reservoirs for drinking water is ongoing, with several feasibility studies and environmental assessments in progress. Financial support is needed to proceed with the construction of reservoirs such as Yatimahana and Pali Aru, with land consent still pending for some projects. By 2030, the augmentation and restoration of these tanks will significantly improve water management and resilience.

NDC 8: Efforts to introduce alternative water resources for climate resilience are in the early stages, with feasibility studies underway for utilizing groundwater recharge and alternative water sources for irrigation. The focus is on assessing and identifying priority areas that would benefit from these sources, with a particular emphasis on groundwater recharge systems. Regulatory measures for the use of agro wells in irrigation are also being implemented, with awareness programs targeting farmers on safe abstraction levels. A key challenge remains the lack of gender expertise within planning units, which limits the incorporation of gender-

responsive policies. However, this gap is being addressed, and it is anticipated that gender-inclusive measures will be integrated by 2030. Additionally, the development of regulations for groundwater use is expected to contribute to more sustainable water management.

NDC 9: The efficiency of water use in Sri Lanka's irrigation schemes is a key component of climate resilience. The goal is to increase water use efficiency in irrigation systems by 10%, covering 45,000 ha of irrigated land by 2030. While work has commenced on this, challenges such as budgetary constraints and the departure of trained engineers have impacted progress. Despite these challenges efforts to introduce micro-irrigation systems and low-water-intensive crops are ongoing, with significant progress made in introducing micro-irrigation systems and expanding the range of crops suited for water-efficient farming. Training programs for farmers on water-saving applications continue to be held, and the participation of women farmers is encouraged, with at least 10% of training sessions involving female farmers. By 2025, the target is to complete a pilot study on water allocation mechanisms and improve water distribution efficiency through better management practices.

NDC 10: NDC 10 focuses on assessing river floods, implementing mitigation measures, and enhancing early warning systems to address potential flash floods in five priority basins: Kelani Ganga, Attanagalu Oya, Kalu Ganga, Kirindi Oya, and Malwathu Oya. The first phase involves installing river and reservoir gauges, along with collecting rainfall and river flow data, ensuring that all five basins are covered by a robust hydro-meteorological data network. As of now, 16 stations have been installed across these basins, with preparatory work for the World Bank's CResMPA project initiated, aiming for full coverage by 2030. The next step involves preparing digital elevation models (DEMs) for these basins, which will be complemented by the establishment of automated early warning systems. Currently, DEMs are available for the Kelani and Attanagalu basins, and manual early warning systems are in place for all five priority river basins. Efforts to upgrade early warning systems and prepare DEMs for flood-prone areas in three additional basins are expected to be completed by 2025. Capacity building programs will be implemented to enhance the competency of staff working with the new systems, with a focus on ensuring gender inclusivity in training and participation. A mobile app and web portal for flood warnings will be introduced, aiming to reach at least 50% of women in the target communities by 2025. In parallel, flood mitigation structures will be introduced to manage the risks posed by climate change, with existing structures in the Kalani and Kalu basins being enhanced, and new structures, such as the Ambathale salinity barrier and Wee Oya reservoir, added by 2030. This comprehensive approach integrates data collection, technological innovation, capacity building, community outreach, and infrastructure development to improve flood management and resilience in the priority river basins.

The details of the NDC tracking are attached in Annex 25.

2.4.5 Biodiversity sector

The biodiversity sector NDCs include several critical initiatives aimed at enhancing Sri Lanka's climate resilience, with significant progress observed in key areas. Under NDC 1, efforts to identify habitats vulnerable to climate change have been initiated, although complete vulnerability maps for biodiversity sectors were not yet available as of 2023. Efforts to prepare

maps for vulnerable ecosystems, including terrestrial wetland landscapes and coastal/marine areas, are underway, with significant progress in mapping areas such as mangroves and degraded habitats. The Forest Department (FD) has been actively involved in restoration efforts, including the restoration of 540.16 ha in 2021 and the restoration of 45 ha of mangrove in 2022, alongside the removal of invasive species in critical areas like Horton Plains. NDC 2 focuses on enhancing connectivity through landscape and seascape approaches, with feasibility assessments identifying key corridors, though the integration of climate vulnerability is still in progress. In NDC 3, the identification of ESAs for inclusion in PAs has progressed, with several new sanctuaries being considered for gazette notification. Lastly, NDC 4, which addresses ex-situ conservation programs, aims to establish new facilities for the conservation of both flora and fauna in climate-vulnerable regions, with ongoing plans for new botanical gardens and zoological centres. NDC 5 focuses on the controlling of invasive alien species spreading due to changing climate conditions. Overall, while the process is still ongoing, these actions are laying the foundation for a more climate-resilient ecosystem in Sri Lanka by 2030.

The details of the NDC tracking are attached in Annex 26.

2.4.6 Coastal and Marine sector

Sri Lanka's coastal and marine NDCs outline key climate adaptation and mitigation actions with notable progress. Under NDC 1, the establishment of a historical tidal database by the National Aquatic Resources Research and Development Agency (NARA) is underway, with data collected from key coastal sites like Point Pedro and Colombo, and ongoing updates. The revision of Mean Sea Level (MSL) measurements is progressing, and a new sea-level monitoring station was established at Point Pedro in 2023. However, financial constraints have delayed further planned expansions. NDC 2 focuses on coastal vulnerability, with no significant work done on inundation maps or vulnerability assessments yet, though procurement of necessary data is in progress. NDC 3 emphasizes shoreline management and ecosystem restoration, including the restoration of 100 ha of coastal ecosystems in the Puttalam, Trincomalee, Ampara, Batticaloa and Mullaitivu districts, working towards a target of 1,000 ha by 2030. NDC 4 involves the identification and declaration of high-priority coastal and marine natural areas, with 38 sites identified for inclusion in the Coastal Zone Management Plan (CZMP) for 2024-2029. Despite some financial and logistical challenges, these ongoing efforts contribute to Sri Lanka's climate resilience and coastal protection goals.

The details of the NDC tracking are attached in Annex 27.

2.4.7 Health sector

The progress of the five adaptation NDCs for the health sector from 2021 to 2023 is mentioned as follows:

NDC 1: Policy Initiatives for Enhancing Climate Resilience in the Health Sector by 2030.

The progress under NDC 1 includes significant efforts in developing key policies and plans. A draft Heat-Health Action Plan (HHAP) has been prepared, with stakeholder consultations conducted in 2023 and certain actions, such as early warnings for heat events, already implemented. Development of the National Strategic Plan for Health, Environment and

Climate Change (NHSPEC) has started, with consultations completed and funding sources identified, targeting completion by 2025. Guidelines for Green and Healthy Hospitals are being developed, with consultations conducted in 2023 and completion expected by 2024. An air pollution-related health action plan is also under development, following consultations and a desk review in 2023. Overall, the activities under this NDC are progressing as planned.

NDC 2: Improved Capacity to Manage Climate Change-Linked Non-Communicable Diseases (NCDs)

Efforts under this NDC have focused on identifying and addressing diseases exacerbated by climate change. Key achievements include identifying climate-sensitive diseases in 2023, initiating comprehensive guideline development for prioritized diseases and preparing a carcinogen atlas to aid capacity building. Vulnerable populations have been identified, and a roadmap for managing climate-induced NCDs is underway, with completion expected by 2026. While a formal research agenda has not started, ongoing research activities have met the target of one study per year until 2023.

NDC 3: Managing Worsening Nutrition-Related Health Impacts

Progress in addressing climate-induced nutritional challenges has been notable. A mechanism for early warnings on food availability is being developed, with vulnerable groups identified. Programs targeting improved nutrition among these groups are underway, including the creation of the SNEHA foster care scheme for severely malnourished children in 2023. Early interventions for climate-related nutrition issues have included training programs and the development of Emergency Nutrition Action Plans for five districts.

NDC 4: Strengthening Surveillance and Management of Climate-Sensitive Vector and Rodent-Borne Diseases

Under NDC 4, disease surveillance systems for dengue, malaria, filariasis, leishmaniasis and leptospirosis have been strengthened, with the National Dengue surveillance system (NaDSYS) was upgraded from sentinel DENSYS system to comprehensive NaDSYS in 2023. Early warning systems integrating climate and epidemiological data are operational, especially for dengue. Extensive capacity-building programs have trained 450 participants and risk communication strategies, including media seminars, have been enhanced. Inter-sectoral coordination has been reinforced with Presidential Task Force meetings and an ICT platform to support information sharing.

NDC 5: Reducing Morbidity and Mortality from Extreme Weather and Climate Events

Efforts to mitigate the impacts of extreme weather events have focused on improving early warning systems, with a functional dissemination mechanism established by 2023. Risk assessments for climate hazards have begun, with mapping completed for two provinces. Health preparedness plans for disaster events have been developed for two provinces, while public awareness campaigns on health risks associated with climate change are actively conducted through multiple media channels.

The details of the NDC tracking are attached in Annex 28.

2.4.8 Urban Planning and Human Settlement sector

Sri Lanka's climate adaptation measures in this sector are aligned with its adaptation related NDCs. Progress reported here focuses on the implementation of adaptation initiatives during the timeframe of 2021 to 2023.

Considering NDC1, NDC3 and NDC4, the National Physical Planning Department is primarily responsible for the preparation of National and Regional plans, while the UDA oversees local authority areas in Sri Lanka, including coastal settlements. The UDA also leads several key activities under NDC3 and NDC4. For NDC2, leading agencies include the Disaster Management Centre and the National Building Research Organization, with the Ministry of Urban Development and Housing responsible for several specific activities.

One of the key revisions to the National Physical Planning Policy gazetted in 2019 was the incorporation of climate and vulnerability risks into the policy framework. Although local authorities are designated as the key agency for preparing Local Development Plans within their jurisdictions (activity 1.3), planning activities are currently carried out by the UDA in declared areas, which cover the entire areas of 158 local authorities and parts of 121 others (a total of 279 local authority areas). This arrangement is due to the limited capacity of local authorities to conduct integrated planning in their regions.

Similarly, in activity 2.2.2 (implementation and maintenance of infrastructure with attention to runoff systems, drainage, and flooding) the local authorities are designated as the key agency, with the target of managing river basins. However, as discussed in focus group sessions, local authorities are limited to maintaining only parts of the drainage systems within their jurisdictions, as per their legal mandate. Setting a target at the river basin level makes tracking progress challenging. The details of the NDC tracking are presented in Annex 29.

NDC1 - Enhance the resilience of human settlements and infrastructure through mainstreaming climate change adaptation into national, subnational and local level physical planning (2025).

A considerable progress of most activities under this NDC is achieved with the amendment of National Physical Planning Policy for 2048 (Figure 2.4) by the National Physical Planning Department. This revised plan had incorporated the climate change impacts and vulnerabilities in Sri Lanka as identified and reported to the via focus group discussions. The revised plan is yet to be gazetted. However, the progress of the preparation of sub national plans has not seen a satisfactory progress during the period.

The recent efforts by the UDA to accelerate the local area planning can be recognized as a satisfactory progress. However, this requires further acceleration to meet the expected target.

Several activities under require further revision considering its description, scope, lead agency, target and the potential mechanisms required for NDC tracking.

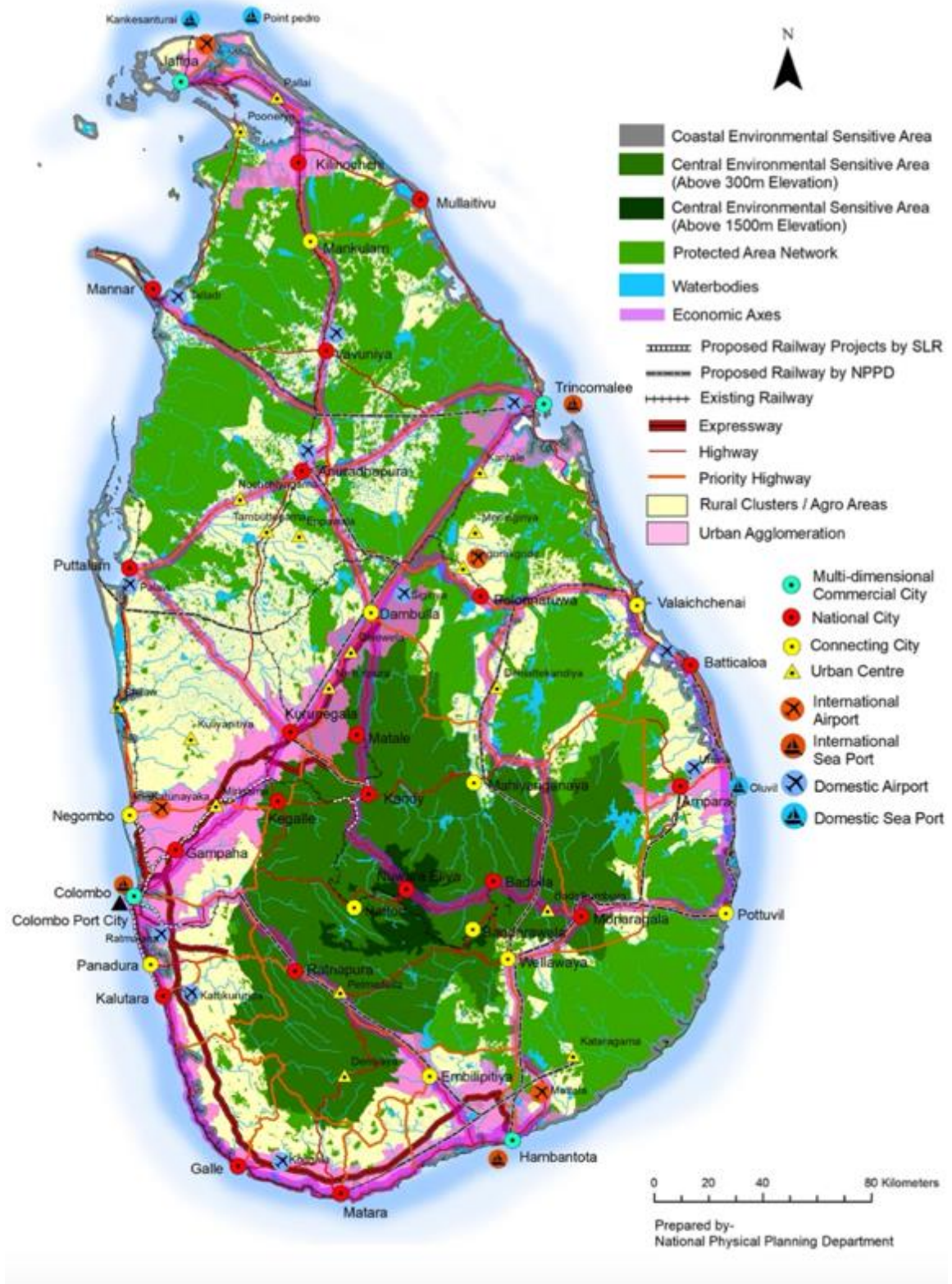


Figure 2.4: National Physical Planning Policy for 2048 (prepared and yet to gazetted)
 Source: <https://drive.google.com/file/d/1jwXqCf86RZAB9UO2qC6CgEALmLDXTvMZ/view>

NDC2 - Incorporate Disaster risk reduction (DRR) into urban and human settlement planning/ implementation in areas of high vulnerability to climate change risks (2025)

Most activities under thus NDCs also reported a considerable progress with recent efforts by National Building Research Organization (NBRO) and Disaster Management Center. NBRO's involvement is mainly with landslides prone areas of the country. The databases that are published by Disaster Management Center continue to serve as useful information source for policy makers, further improvement in the resolution of maps was suggested during Focus Group Discussions. Recently published National Disaster Management Plan for 2030 has provided a strong basis to meet the expectations of the NDCs. However, this require a revising of the NDC activities, scope and targets to be aligned with the plan.

Several activities under require further revision considering its description, scope, lead agency, target and the potential mechanisms required for NDC tracking. This particularly with respect to activities that related to riverine and urban floods in Sri Lanka.

NDC3 - Establish climate resilient built environment (2030)

The environmental strategies prepared within the local area development plans (cross reference to NDC1 progress reporting) serve as key modality in achieving the expected targets of the activities under NDC3. The ability to complete local area plans for all UDA declared areas will serve further in achieving expectations of establishing a climate resilient built environment in Sri Lanka.

In addition, best practices initiated by UDA also contributed to the progress of the activities. These include the Green Building Certificate scheme and one stop unit (currently available in Western Provinces) initiated by UDA during 2021-2023. As revealed during FGDs, Technical, financial and capacity building support is required to upscale and wider application of these practices covering entire Sri Lanka.

Several activities under require further revision considering its description, scope, lead agency, target and the potential mechanisms required for NDC tracking.

NDC4 - Minimize the impact of slow onset events (sea level rise) on coastal settlements and infrastructure (2030) reef coastal zone

In addition to the local area plans prepared for coastal cities by UDA (cross reference to NDC1), the efforts and initiatives by Coast Conservation and Coastal Resource Management Department had contributed to the progress recorded for activities in NDC4.

Several activities under require further revision considering its description, scope, lead agency, target and the potential mechanisms required for NDC tracking.

2.5 NDC - SDG interlinkages

Sri Lanka has demonstrated a strong commitment to achieving the Sustainable Development Goals (SDGs) as outlined in the United Nations 2030 Agenda. As a signatory to this global framework, Sri Lanka has prioritized the integration of climate action with development strategies, aiming to create a balance between environmental sustainability, social equity and economic development. This section presents the relationship between Sri Lanka's NDCs and

the SDGs, emphasizing the synergies, interlinkages and potential trade-offs associated with the implementation of climate actions in the country.

In 2015, Sri Lanka committed to achieving the SDGs by 2030, incorporating climate action as a core element of its sustainable development framework. To achieve these global goals, Sri Lanka's NDCs, which outline the country's climate actions and emissions reduction targets, have been aligned with the SDG framework. This alignment was further reinforced through the Sustainable Development Act, No. 19 of 2017, which established a High-Level Sustainable Development Council tasked with overseeing the implementation of the SDGs in the country.

In the process of revising the NDCs, Sri Lanka conducted a detailed review to assess how proposed climate actions align with the SDGs and whether they could potentially interfere with or complement the achievement of these goals. The use of the SDG Climate Action Nexus (SCAN) tool during the NDC revision process enabled the country to assess over 270 interlinkages between climate actions and SDG targets, revealing a complex landscape of positive synergies and potential trade-offs.

2.5.1 Key findings from NDC-SDG interlinkages

The analysis of NDCs through the SCAN tool has yielded several key insights into the interlinkages between climate action and the SDGs in Sri Lanka:

2.5.1.1 Positive interlinkages

Sri Lanka's NDCs demonstrate strong positive interlinkages with key SDGs, advancing sustainable development objectives. Climate actions aligned with SDG 7 promote renewable energy initiatives such as solar, wind, and hydropower, addressing energy poverty and supporting carbon neutrality by 2050. These efforts also align with SDG 8 by creating jobs through green technologies, sustainable farming and climate-resilient infrastructure, fostering economic growth. Additionally, the adoption of climate-smart technologies and sustainable manufacturing bolsters SDG 9 by advancing resilient infrastructure and innovation. Furthermore, the NDCs support SDG 11 by focusing on sustainable urban development through climate-resilient cities, efficient public transport and improved waste management systems.

2.5.1.2 Trade-offs and mixed interactions

While Sri Lanka's NDC actions largely complement SDGs, certain trade-offs and mixed interactions exist. The transition to renewable energy, aligned with SDG 1, may impose short-term economic burdens on poorer communities, potentially exacerbating energy poverty if not managed carefully. Similarly, large-scale renewable energy projects, such as hydropower dams and land-based solar farms, could negatively impact on ecosystems and biodiversity, challenging SDG 15. Proper planning and environmental safeguards are essential to mitigate these issues.

2.5.1.3 Sectoral interlinkages

Different sectors have varying degrees of synergy with the SDGs (Ross, 2024):

Agriculture: Agriculture-related NDC actions, particularly those aimed at implementing resilient agricultural practices and sustainable food production systems, have numerous synergies with SDGs, particularly SDG 2: Zero Hunger. Sustainable farming methods contribute to food security, enhance productivity and reduce vulnerability to climate-induced hazards. However, some challenges exist in balancing agricultural expansion with the conservation of land ecosystems (SDG 15).

Transport: The transport sector’s climate actions, such as promoting electric vehicles and public transportation systems, align well with SDG 9 and SDG 11, fostering cleaner, more sustainable urban mobility. However, there are trade-offs with SDG 6: Clean Water and Sanitation, as some transport infrastructure projects, such as roads or railway lines, may negatively affect water systems or agricultural areas.

Power (Electricity): The Electricity (Power) sector’s NDC actions, such as expanding renewable energy capacity, have a significant positive impact on SDGs 7 (clean energy) and 13 (climate action). However, they may result in trade-offs with SDG 1 (poverty) and SDG 6 (clean water) due to the potential land and water use conflicts associated with hydropower projects and the environmental impact of energy infrastructure development.

Industry, LULUCF and Waste: The NDC actions within the industrial, LULUCF and waste sectors show strong positive synergies with the SDGs. Efforts to reduce industrial emissions, promote sustainable LULUCF practices, and enhance waste management are aligned with SDG 12: Responsible Consumption and Production, SDG 13: Climate Action, and SDG 15: Life on Land.

Figure 2.5 depicts the summarized interactions between main sector and their mitigation actions and SDGs.

SDG	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
Agriculture	●	●	●	●	●	●	●	●	●	●	●	●	■	●	●		
Power (Electricity)	●	●	●	●		●	●	●	●	●	●	●	■	●	●		
Industry	●	●	●	●		●	●	●	●		●	●	■	●	●		
Waste	●	●	●			●	●	●	●		●	●	■	●	●		
Transport	●	●	●		●	●	●	●	●		●	●	■	●	●		
Forestry	●	●	●			●	●	●	●		●		■	●	●	●	

Figure 2.5: Summarized interactions between main sectors and their mitigation actions and SDGs

Colour chart depicting colour codes for the different level of NDC-SDG interlinks

Colour	Interlink
100%	Strong interlinks, and all positive aspects complementary to SDGs
75-99%	Strong interlinks and synergies and active contributions to SDGs though a few trade-offs
50-75%	Moderate contribution to SDGs/SDG targets
25-49%	Trade-off outweigh synergies, and has some negative impacts
0-24%	Mostly negative or trade-offs, and may have a negative impact on SDG targets
	No Interlink

Table 2.17 provides an overview of the development co-benefits of adaptation actions, mapping them to corresponding SDG targets. It highlights the positive correlations between adaptation measures and SDGs, particularly under Goal 13 for climate action and Target 1.5 for reducing risks from extreme weather events. The table also shows how sector-specific adaptation measures align with relevant SDGs in areas like agriculture, health, biodiversity and water, while noting potential trade-offs where achieving certain SDGs could increase climate vulnerability.

Table 2.17: Linkages between SDGs and adaptation NDCs

NDC Sector	Corresponding SDGs (+)	
All adaptation NDCs		13.1/13.2/ 13.3 & 13b
Agriculture		1.5 2.4/2.5 6.4/6.5
Biodiversity		14.2/ 14.5 15.1/15.2/15.3/15.4/15.5 and 15.8
Coastal		14.2/14b 11.9
Fisheries		14.2/14.4/ 14.5
Health		3.3/ 3.4/3.9 and 3d 2.2
Livestock		2.4 and 2a
Water & Irrigation		6.1/6.3/6.4/6.5/ 6.6 & 6a/ 6b
Urban		11.3/11.5/11.6/11.9/11.10
Tourism		8.9 9.4

CHAPTER 3

Information related to climate
change impacts and adaptation

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Information related to climate change impacts and adaptation

3.0 Overview

As a tropical island nation, Sri Lanka faces significant impacts from climate change across all aspects of its economy, ecosystems and society. The country is already experiencing extreme weather events and coastal erosion, which affect various strata of the society, particularly the more vulnerable, economically disadvantaged communities. This chapter presents an overview of Sri Lanka's climate vulnerabilities, its climate adaptation strategies and the progress made in implementing adaptation measures

3.1 National circumstances, institutional arrangements, and legal frameworks

Sri Lanka, like many other developing countries, has been experiencing significant adverse impacts from climate change in recent years. These climatic changes have led to rising concerns regarding agricultural productivity, the health of ecosystems and the overall well-being of the population in Sri Lanka.

One of the most notable impacts of climate change has been the increase in the frequency and intensity of rainfall events and prolonged drought periods, causing widespread floods and water shortages. In this respect, Sri Lanka has witnessed severe flooding from the southwest monsoon, particularly in the wet zone. More frequent and intense landslides also have been experienced in central highlands. The 2016 and 2017 floods in the wet zone and prolonged droughts in the dry zone, have severely impacted both rural and urban communities. Temperature records have shown significant warming trends, with the average temperature increasing by 0.13°C per decade since the 1960s.

Sri Lanka has also faced disruptions in agriculture due to changing weather patterns, which have impacted crop yields by droughts, while unpredictable rainfall patterns have affected the timing of cropping seasons. Furthermore, the fishing industry in coastal areas has been disrupted by rising sea levels and changes in marine biodiversity, making the livelihood of many dependent communities increasingly vulnerable.

In response to these challenges, Sri Lanka has taken significant steps to integrate climate change adaptation into its national policies and development strategies. The National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025 is being updated. Presently it provides a roadmap for adapting to the adverse impacts of climate change.

CCS works closely with all the relevant stakeholders, to promote a coordinated response to climate-related risks. The updated National Policy on Climate Change in 2023 refers to implementing smart adaptive measures to minimize the negative impact of climate change ensuring sustainable development of the country and emphasizes integrating adaptation strategies into national development planning, focusing on all vulnerable sectors.

The CCS has established a National Expert Committee on Climate Change Adaptation to facilitate and seek experts' opinion on addressing adaptation measures.

3.1.1 Bio geophysical characteristics, demographics, economy, infrastructure and information on adaptive capacity

As an island that is highly dependent on its natural resources, such as water, forests, and coastal ecosystems, Sri Lanka's environmental characteristics directly influence its vulnerability to climate change. The country's coastal ecosystems, including coral reefs and mangroves, play a crucial role in protecting coastal populations and infrastructure but are increasingly under threat from rising sea levels and human activity.

A large segment of the population still lives in rural areas, where agriculture is the primary livelihood. These rural populations, particularly those in the dry zone and coastal areas, face heightened vulnerability due to their dependence on natural resources and limited access to adaptive technologies. The demographic structure is increasingly ageing, with a growing proportion of elderly individuals, which places additional pressure on healthcare systems and climate resilience efforts.

The vulnerability of rural communities is compounded by socio-economic factors such as poverty, limited access to infrastructure facilities, and reliance on primary agriculture practices, making these populations particularly sensitive to the impacts of climate change. Urban areas have seen some improvements in infrastructure facilities and adaptive capacity. However, challenges related to flooding, deteriorating air quality, and urban heat island effect still persist.

Sri Lanka's economy is predominantly driven by agricultural exports such as tea, rubber, and coconut. The agricultural sector is highly sensitive to climate variability. Tourism is another critical sector, and the impacts of climate change, particularly those on coastal areas and natural attractions, are a growing concern for long-term sustainability. Coastal infrastructure, such as harbours and tourist facilities are increasingly threatened by rising sea levels and extreme weather events.

Sri Lanka's efforts to improve infrastructure resilience include the implementation of disaster risk reduction programs, such as flood management systems and early-warning systems. However, gaps remain, particularly in ensuring that infrastructure is climate-resilient across the entire nation. Lack of funding and technical capacity often hinders the full implementation of these measures especially related to roads, electricity and water supply.

In addition to government-led initiatives, local knowledge and practices have played a significant role in adapting to climate risks. Communities in rural and coastal areas often rely on traditional knowledge for disaster preparedness and resource management. The country's adaptive capacity is also strengthened by bilateral and multilateral support and partnerships.

3.1.2 Institutional and legal framework for climate change adaptation measures

Sri Lanka has made substantial progress in establishing a comprehensive institutional and legal framework to address climate change adaptation. A Climate Change Act is presently being drafted to provide a legal framework with institutional setup on climate action. There are various acts and regulations at the sectoral level to support climate action directly and indirectly. Some of these are highlighted as follows:

- **National Environmental Act (1980, amended):** This act ensures that environmental sustainability is incorporated into all development projects. It requires Environmental Impact Assessments (EIAs) for initiatives that may affect the environment, thus safeguarding against potential climate-related harm.
- **Forest Conservation Ordinance (1907, amended):** This legislation emphasizes the protection and sustainable management of forest resources, which play a critical role in climate adaptation through carbon sequestration and ecosystem services.
- **Coast Conservation Act (1981, amended):** This act governs the sustainable management of coastal areas in Sri Lanka, aiming to protect coastal ecosystems while addressing climate change impacts such as sea-level rise and erosion.
- **Fisheries and Aquatic Resources Act (1996):** While primarily focused on managing marine and freshwater resources, this act supports climate resilience by promoting sustainable fishing practices and protecting aquatic ecosystems, which are increasingly vulnerable to climate change.
- **The National Physical Planning Act No. 49 of 2000:** (amendment to Town and Country Planning Ordinance No. 13 of 1946) provides a strong legal foundation, establishing the National Physical Planning Council, chaired by the President. This council has the authority to drive adaptation policies and actions at national scale. The Updated National Physical Planning Policy & Plan - 2048 prepared in 2023, by the National Physical Planning Department has the potential to mainstream climate change adaptation.

3.1.2.1 Institutional bodies and coordination mechanisms

The institutional and coordination mechanisms described in Section 2.1 is also relevant to climate change adaptation.

3.1.2.2 Public access and transparency through web-based platforms

(To promote transparency, Sri Lanka is developing web-based platforms to provide access to emissions data, adaptation strategies and climate profiles. These platforms encourage partnerships and promote public engagement in climate action by ensuring open access to information.)

Sri Lanka's structured and legally backed framework for climate adaptation exemplifies a holistic approach to resilience. Through national oversight, sector-specific and regional coordination, and robust monitoring, Sri Lanka demonstrates how an integrated approach to climate adaptation can effectively mitigate risks and protect vulnerable communities and ecosystems. This evolving model offers valuable insights for other nations seeking to establish sustainable and effective climate adaptation strategies.

3.2 Impacts, risks and vulnerabilities

3.2.1 Current and projected climate trends and extreme events in Sri Lanka

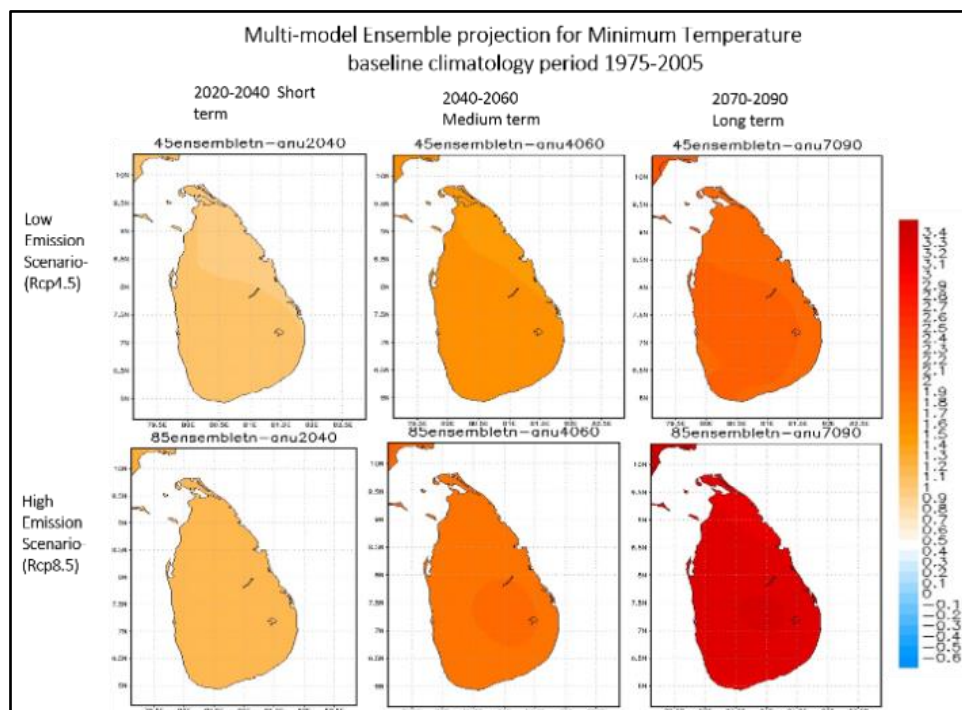
Sri Lanka's current climate trends are heavily influenced by its location in Indian Ocean and tropical region.

Variability in monsoon patterns has intensified since the mid-20th century, with notable deviations in onset timings and precipitation amounts. Contrarily, the south-eastern dry zone shows an increase in seasonal rainfall, linked to changes in the Indian Ocean Dipole (IOD). Further to the climate profile detailed in Section 2.1.3, the current climate trends are outlined as follows.

A) Temperature Trends

The ambient air temperatures are rising across Sri Lanka, with many stations recording an increase in mean air temperature anomalies. This warming trend is characterized by a higher number of warm days and nights, fewer cold days and nights, increased mean daytime maximum temperatures and higher number of mean night-time minimum temperatures. The rise in night-time minimum temperatures appears to contribute more significantly to the overall increase in annual temperatures compared to daytime maximum temperatures. The rate of warming has accelerated in recent years, though it is not uniform across the country, with the most significant increases observed in the Puttalam region. Additionally, urban areas experience elevated temperatures due to the urban heat island (UHI) effect, which is driven by factors such as reduced vegetation cover, high heat retention by built-up environments, and the accumulation of waste heat from various sources (MoE, 2022).

Figure 3.1 illustrates the multi-model ensemble of change in maximum temperature (up) and minimum temperature (bottom), relative to 1975-2005 for moderate emission scenario (top; RCP 4.5) and high emission scenario (bottom; RCP 8.5) for time periods; short (2020-2040), medium (2040-2060) and long (2070-2090).



Source: Jayawardena et al., (2018)

Figure 3.1: Multi-model ensemble projection for minimum temperature baseline climatology period (1975 – 2005)

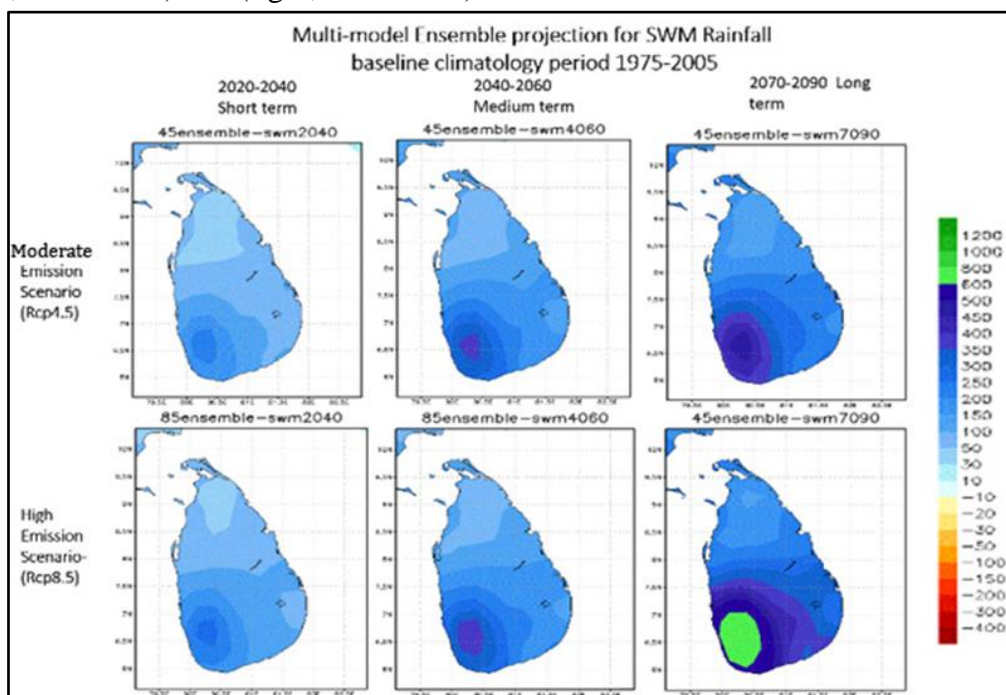
Increases in air temperature observed in the recent past and anticipated increase in future projections are likely to have huge impacts on evaporation and evapotranspiration.

B) Rainfall Variability and Patterns

Rainfall trends in Sri Lanka are increasingly erratic due to climate change, with both the South-West and North-East monsoons showing variability that results in excessive rainfall or extended dry spells. Prolonged droughts in the dry zone, while extreme rainfall events are prominent in the western and central regions, with the 2016 and 2017 floods exceeding the 10-year return period thresholds projected for extreme events (MoE 2022).

According to the Climate Risk Country Profile (World Bank, 2021), there is an anticipated decline in annual rainfall in key agricultural zones, intensifying water scarcity in areas reliant on rain-fed irrigation. The occurrences of flash floods have doubled since 1990, attributed to increased intensity of inter-monsoon rains. It is anticipated that a 5–10% decrease in annual rainfall in the dry zones and an increase in extreme rainfall events in the wet zones by 2030.

Figure 3.2 indicates that the annual rainfall anomaly to be negative in the dry zone, especially in the north-eastern parts, however, positive in southwestern parts in the short term, while the anomaly is positive and increasing under the RCP 4.5 thereafter. The annual rainfall anomaly is positive and increasing under RCP 8.5, where this increment would be significant in the wet zone. Figure 3.2 illustrates the multi model ensemble of change in southwest monsoon rainfall, relative to 1975-2005 for RCP 4.5 (up) and RCP 8.5 for time periods (left; 2020-2040), (middle; 2040-2060) and (right; 2070-2090).



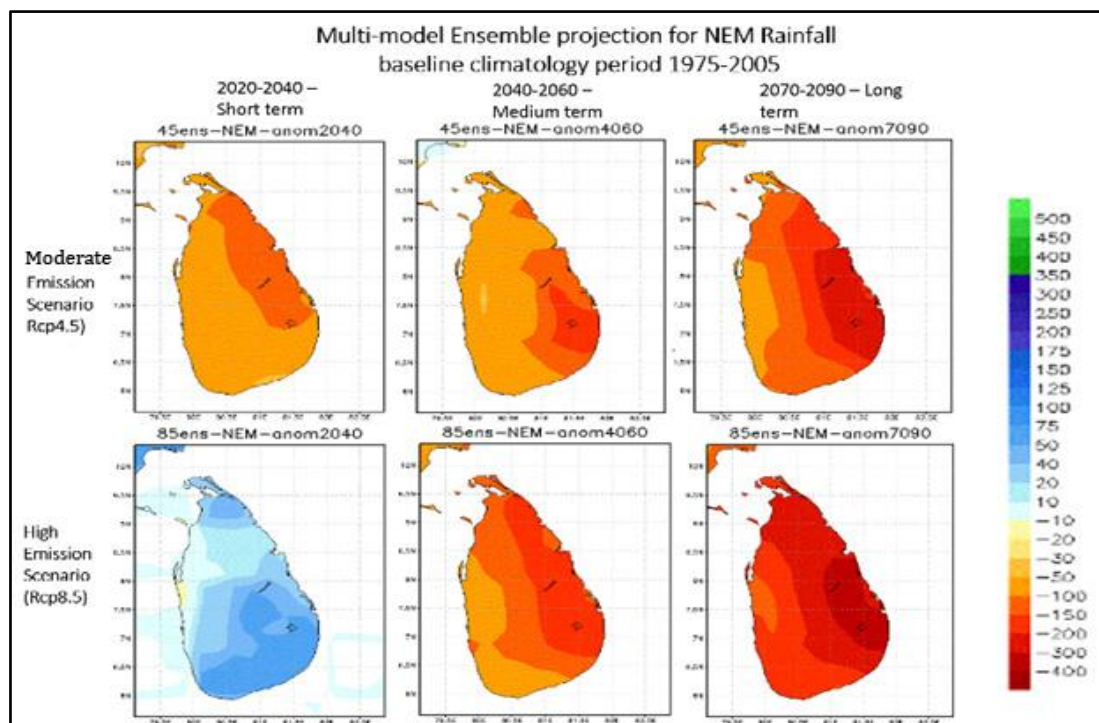
Source: Jayawardena et al., (2018)

Figure 3.2: Multi-model ensemble projection for SWM rainfall baseline climatology period (1975 – 2005)

The TNC outlines strategies such as rainwater harvesting and improved irrigation efficiency to mitigate the impacts of rainfall variability.

The current status aligns with earlier predictions, with the frequency and intensity of extreme weather events progressing faster than anticipated. This trend underscores the increasing risks of water scarcity in dry zones and flood damage in wet zones, necessitating urgent implementation of adaptive measures.

Changes in Northeast monsoon (NEM) rainfall compared to the baseline climatology clearly indicate a negative rainfall anomaly, especially in the dry zone under RCP 4.5 and RCP 8.5 scenarios. More frequent droughts are expected in the dry and intermediate zones. Rainfall reduction in the NEM will increase vulnerability of agriculture sector to prolong droughts, as nearly 70% of rice cultivation takes place during the *Maha* season in the dry zone in Sri Lanka. Figure 3.3 show the multi-model ensemble of change in Northeast monsoon.



Source: Jayawardena et al., (2018)

Figure 3.3: Multi model ensemble of change in Northeast Monsoon (NEM) rainfall

Projected changes in precipitation patterns, changes in extreme weather events and increasing evaporation could result in reduced water availability and thereby the decrease in agricultural productivity in the dry zone.

C) Sea Level Rise

Sea levels around Sri Lanka have been rising consistently by approximately 3 mm annually, as confirmed by measurements. Coastal areas, particularly in the southern and western provinces, are already facing increased erosion, saline intrusion, storm surges and kind tides (tide flood/ coastal flood). Inundation maps of Sri Lanka project that 20% of Colombo’s land area could be affected by 2100 under RCP 8.5. Key infrastructure, including the Colombo Port and tourist hotspots like Hikkaduwa, are identified as high-risk zones (MoE, 2022). A significant seasonal

variation in sea level, ranging from 18–22 cm has been observed in the southern region over the last 22 years alongside a positive trend of approximately 3.12 mm per year along the Sri Lanka's Southern Coast (Indika, 2022).

Sea level rise is expected to exacerbate coastal erosion and flooding in low-lying areas and the vulnerability of the Western and Southern coasts are high due to their population density and concentration of economic infrastructure.

Integrated Coastal Zone Management (ICZM) is urgently needed to mitigate the impacts of rising sea levels and protect critical infrastructure and economic assets. Observed changes are consistent with projections, with impacts such as coastal erosion and saline intrusion becoming evident earlier than anticipated. This underscores the pressing need for proactive adaptation strategies to address the accelerating risks posed by sea-level rise.

D) Ecosystem Responses

Projections anticipated a decline in biodiversity and ecosystem services due to rising temperatures and changing precipitation patterns, with forests in the dry and intermediate zones being particularly vulnerable. Observations confirm declines in species richness and ecosystem degradation, especially in biodiversity hotspots like Sinharaja and the Knuckles Mountain Range. Coral bleaching incidents have also intensified due to rising sea surface temperatures. The observed degradation of ecosystems is consistent with projections, although the rate of biodiversity loss in some areas, such as coastal reefs, is exceeding earlier estimates which calls for enhanced conservation efforts.

3.2.1.1 Observed adverse weather events

Floods are among the most frequent and destructive natural hazards in Sri Lanka, particularly during the South-West monsoon and North-East monsoon. Major events, such as the torrential rains in May 2016 and May 2017, displaced over 600,000 people and caused extensive infrastructure damage, while a similar event in 2021 and 2024 had widespread repercussions. Flood-prone areas are concentrated in districts such as Colombo, Gampaha, Kaluthara and Ratnapura. Annual average losses due to floods are estimated at US\$ 240 million. Beyond the loss of life, floods significantly impact infrastructure, the environment, development activities, socioeconomics and livelihoods (DMC, 2023).

Droughts primarily affect the districts in the dry zone. The 2016–2017 droughts impacted over 1.2 million people, reducing surface water availability by 30% and hydroelectric power generation by 25% (World Bank, 2021). Mannar and Puttalam districts are among the areas projected to face intensified dry spells due to declining inter-monsoonal rains. Between 2016 and 2018, over LKR 18 billion was spent on crop losses, water supply and drought relief. From 2011 to 2021, droughts affected over 9.6 million people, with 2014 and 2017 being the worst years. Effective drought management requires a coordinated, multi-agency approach.

Landslides are common in Sri Lanka's Central Highlands, where intense monsoonal rainfall and human activities increase the risk. Between 2011 and 2021, the National Building Research Organisation recorded a 40% increase in landslide events in the Central Province. A notable event was the 2016 Aranayake landslide, which resulted in over 100 fatalities due to slope

destabilization from heavy rainfall. Additionally, floods and landslides displaced over 300,000 people in 2016. Nearly 30% of the country's area is considered landslide-prone, with climate change exacerbating rainfall intensity and landslide risks. Effective landslide risk management is critical, particularly during monsoon and pre-cyclonic seasons.

In addition, it is identified that coastal community and fisheries industries annually experience unidentified events with strong wind, heavy rainfall and particularly low atmospheric pressure conditions. These recurring extreme weather events highlight the urgent need for integrated disaster management and climate-resilient strategies in Sri Lanka.

3.2.1.2 Approaches and methodologies to assess climate trends and extreme events

In Sri Lanka, several institutions are engaged in climate monitoring and assessment, notably the Department of Meteorology, MOE, Natural Resource Management Center (NRMC) and the National Building Research Organization (NBRO). These agencies employ ground-based and remote sensing technologies, including satellite observations to track climate parameters such as temperature, rainfall and humidity, as well as extreme events like cyclones, floods, landslides and droughts. Recent technological advancements have incorporated GPS stations and weather balloons, enhancing data precision and accuracy.

To project future climate scenarios, the MOE and the Department of Meteorology have collaborated with the IPCC and the Asia Pacific Network for Global Change Research (APN) to develop national climate models that account for atmospheric, land, and oceanic systems. These models support the decision-making process related to adaptation activities.

International datasets from the World Bank and the ADB further support these projections, providing critical information for assessing vulnerabilities in key sectors. By integrating these resources, Sri Lanka is strengthening its capacity to adapt to and mitigate the effects of climate change. Using the RCLimDex software developed by the World Meteorological Organization (WMO) Expert Team, these analyses identified a warming trend and a reduction in diurnal temperature ranges (DTR), with minimum temperatures rising faster than maximum temperatures (Jayawardena et al., 2018).

3.2.1.3 Policy implications and adaptation

Sri Lanka has pledged to prioritise investments in climate-resilient agriculture, enhanced water resource management, and coastal zone protection in order to address climate challenges through its NDCs. In the TNC, the emphasis is placed on adaptation strategies that are specific to the region, such as resilient agricultural practices, adaptive infrastructure design for flood-prone areas, and integrated water resource management. Urban planning to withstand extreme climate scenarios, early warning systems and the strengthening of policy frameworks are also critical focus areas. The priority adaptation zones are to be identified and those require immediate interventions to promote sustainable adaptation initiatives.

3.2.2 Climate impacts, risks, and vulnerabilities on different sectors

3.2.2.1 Agriculture sector

Key vulnerabilities discussed in the above negatively impact crop yields (rice, tea, coconut, rubber, pepper and cinnamon etc.) and overall productivity. Crop failures and production losses have become commonplace in paddy fields, as well as for other field and plantation crops.

Agriculture accounts for a significant share of employment in Sri Lanka posing considerable risks to livelihoods, affecting a large segment of the population. As a result, the need for effective adaptation strategies and support systems is increasingly vital to mitigate the adverse effects of climate change on agricultural productivity and community well-being.

The overall potential impacts of climate change on Sri Lanka's food systems are notable. Changes in precipitation and increasing temperatures could severely affect crop yields. Pests and diseases could become more prevalent, further reducing agricultural productivity.

Paddy cultivation is highly susceptible to climate shocks such as droughts, floods, dry spells, and sea-level rise, with rain-fed paddy farmers in the dry zone particularly vulnerable to drought.

Tea cultivation, a key contributor to Sri Lanka's economy, is highly vulnerable to climate impacts. Rising temperatures and drier conditions are expected to significantly affect low-elevation tea plantations. Landslides are particularly prevalent in tea growing regions, where increased rainfall under future climate scenarios may exacerbate the risk. Droughts, coupled with rising temperatures, pose a major challenge to low-country plantations leading to reduced yields, while moderate to severe dry spells could occasionally affect upcountry tea plantation.

Coconut cultivation is particularly sensitive to prolonged droughts, floods, high temperatures and water stress, dries out pollen which adversely affects the fruit formation and reduces coconut yields. Drought risk assessments highlight that coconut cultivation areas such as Puttalam and Mannar face high drought risks, with medium risks in Hambantota and Kurunegala.

Rubber faces challenges from excessive rains and droughts that disrupts tapping and reduces productivity. Rubber growing areas like Kalutara and Kegalle districts are highly flood and landslide prone while there is a lower-risk in coastal regions like Galle and Matara districts. Currently, cinnamon cultivation faces low drought risk. However, under the RCP 8.5 scenario, projected temperature increases and greater rainfall variability by 2030 and 2050 may raise drought risks in cinnamon-growing areas from low to moderate (MoE, 2022).

Pepper is sensitive to prolonged droughts or dry spells and strong winds, which make it unsuitable for cultivation. A distinct dry period combined with adequate rainfall is essential for flower induction and pollination. Pepper cultivation in Sri Lanka's wet and intermediate zones generally faces a low drought risk due to the high rainfall projected by climate models.

Water scarcity and prolonged droughts pose significant challenges to sugarcane cultivation, while unseasonal rainfall and changes in monsoonal patterns are considered critical climatic factors that can negatively impact the crop. Drought during the early and mid-growth stages of

sugarcane primarily results in reduced cane and sucrose yields. Prolonged dry conditions can exacerbate ratoon stunting disease, a significant concern for sugarcane farmers. Conversely, waterlogging is another major issue, severely hindering sugarcane growth and survival.

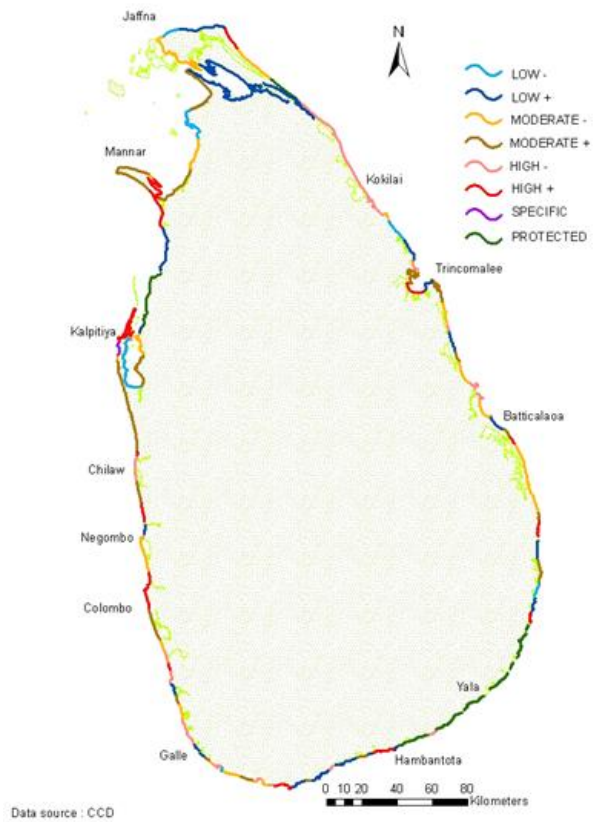
3.2.2.2 Fisheries sector

Sri Lanka's fisheries sector is facing significant threats from climate change, including rising sea levels, ocean warming, acidification and extreme weather events. These changes disrupt vital marine ecosystems such as coral reefs, mangroves and seagrasses, which are essential for breeding and nursery grounds for fish species. Rising sea levels exacerbate coastal erosion and habitat loss, impacting small-scale fishers' livelihoods and food security. Additionally, increased sea temperatures disrupt fish reproduction cycles, affect species distributions and lead to smaller egg sizes and reduced offspring quality, contributing to decreased biodiversity and fish catch variability. Coastal areas, especially those relying on coral reefs, are particularly vulnerable to these climate-related risks.

Inland fisheries are also affected by temperature variability, erratic rainfall and prolonged droughts, which lead to reduced water availability, lower water quality and disruptions in aquaculture systems. Changes in salinity and shifting river flows further stress fish populations, while altered rainfall patterns affect freshwater habitats and monsoonal reservoirs, further complicating food security for inland communities. The increase in extreme weather events, such as cyclones and storm surge, causes direct damage to fishing infrastructure and ecosystems, leading to the loss of fisheries assets and decreased productivity. Coastal communities, particularly in the northern and eastern provinces, are at heightened risk from sea-level rise, storm surges and creeping salinity, all of which threaten livelihoods and infrastructure.

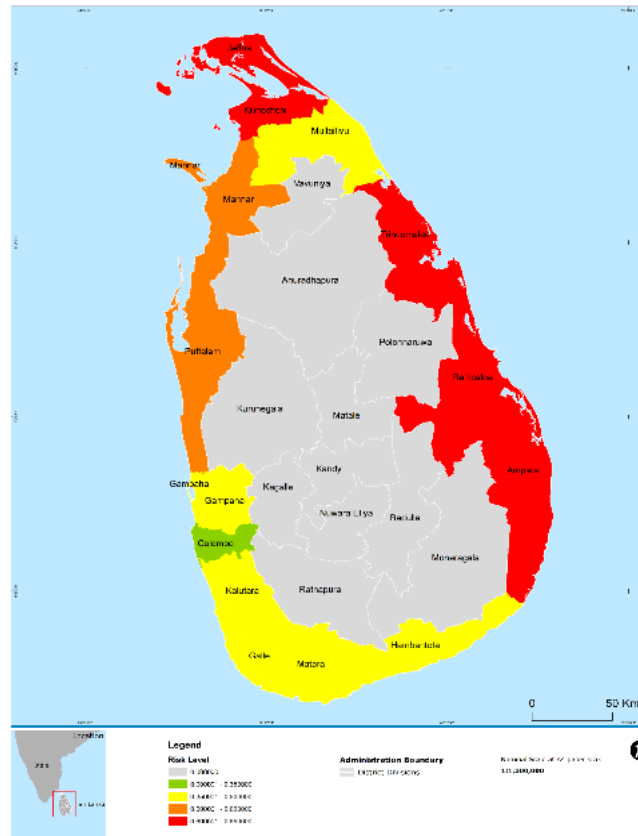
Despite some potential benefits, such as the creation of new habitats from rising sea levels and enhanced growth of certain cultured species in warmer waters. Unsustainable fishing practices, overfishing, pollution and habitat destruction compound these challenges.

Figure 3.4 shows the vulnerability level of the coastline. Figure 3.5 highlights high-risk areas for the inland fisheries sector, showing that districts in the northern, northcentral and eastern provinces are particularly vulnerable. The risk to inland fisheries is projected to worsen due to anomalies in northeast monsoon rainfall (MoE,2022). Figure 3.6 shows the map of inland fishery sector risk due to climate change impacts.



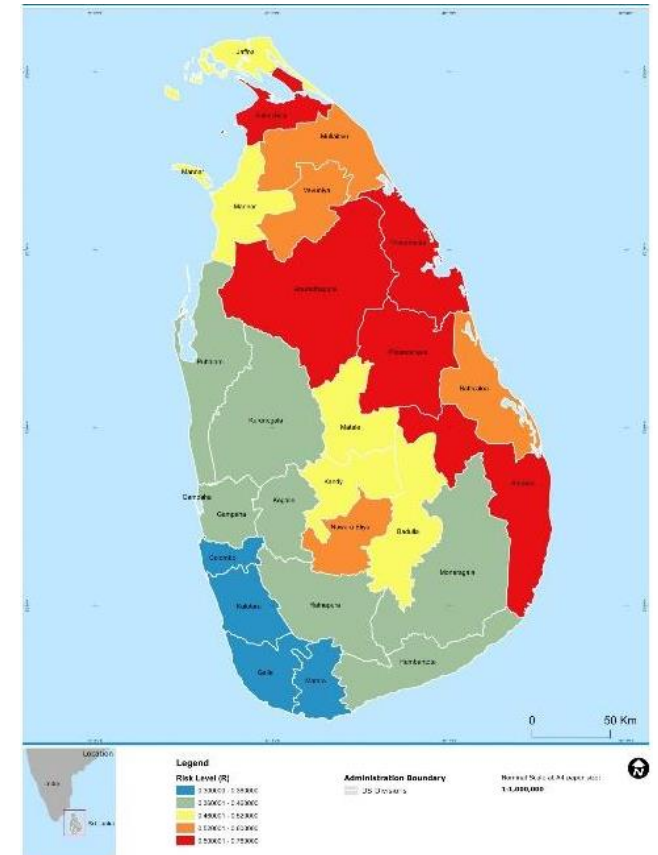
Source: Arulananthan (2016)

Figure 3.4: Vulnerability levels of coastline



Source: MoE (2022)

Figure 3.5: Sea-level rise impacts on coastal fisher population in coastal districts in 2030



Source: MoE (2022)

Figure 3.6: Inland Fishery sector risk to climate change impacts

3.2.2.3 Livestock sector

The increased heat stress has been detrimental to high-yielding dairy cattle, reducing their productivity and reproductive capacity. Further, the impacts of climate change, particularly through prolonged droughts have exacerbated feed, fodder and water shortages, significantly affecting the livestock sector's output. As a result, rural households, which depend heavily on livestock for income, have faced increased economic vulnerability.

Adaptation efforts include exploring climate-resilient practices, such as breed selection, improved feed, and optimized housing to mitigate heat stress. Policies and strategies, including climate-smart agriculture initiatives and insurance programs, are being promoted to safeguard the future of livestock production in Sri Lanka.

The Thermal Comfort Zone (TCZ) for temperate dairy breeds ranges from 5°C to 25°C. In dry regions, the use of these breeds in intensified dairy systems could heighten vulnerability to rising temperatures and increased humidity. When the Temperature Humidity Index (THI) exceeds 72, it results in heat stress for dairy cattle. Projections for 2030 and 2050 indicate that parts of Sri Lanka's intermediate and dry zones will experience higher temperatures, escalating the risk for livestock (MoE, 2022). According to MoE (2022), the upcountry wet zone is the most suitable for exotic breeds due to its relatively stable, favourable climate. However, the further expansion of the dairy industry in these areas is limited by land and fodder constraints. In contrast, the intermediate and dry zones, which host about 88% of dairy cattle, face more significant challenges from increasing temperatures, droughts and diseases due to their greater temperature variability and limited resources.

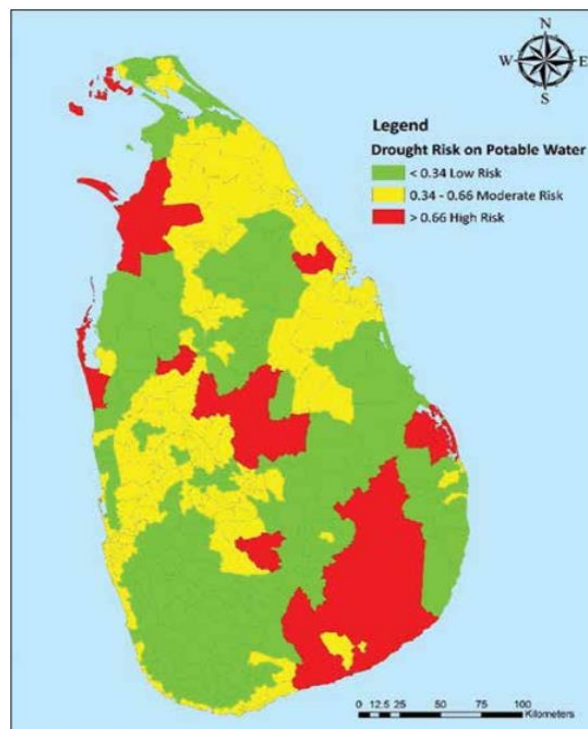
High temperatures, rainfall, and humidity significantly impact poultry production, particularly in terms of meat and egg yield, disease outbreaks, feed intake and overall immune health. Large-scale poultry farms (with over 100,000 birds) often use closed-house systems that regulate climate conditions and are less affected by external weather. These farms make up about 22% of the poultry population in Sri Lanka. However, small and medium-sized farms that use open-house systems are highly vulnerable to climate change impacts, including extreme heat and humidity, which can reduce feed intake and productivity and increase mortality, particularly in broilers nearing market weight. The risk of extreme temperatures is highest in the dry and intermediate zones, with significant temperature increases expected by 2050, intensifying challenges for poultry farmers in these areas. Despite the risks posed by climate change, the poultry industry remains largely sustained, with limited government intervention.

The swine farming industry relies heavily on exotic breeds like “Landrace” and “Large White”, which are more vulnerable to heat and humidity stress. In coastal areas, indigenous pig breeds are also reared for their adaptability to harsh conditions and disease resistance. Swine farming is highly sensitive to temperatures above 28°C, and climate models predict increasing temperatures across the country by 2030 and 2050, particularly in the dry and intermediate zones, which may negatively impact the industry. Even the wet zone could experience conditions that become less favourable for swine farming.

3.2.2.4 Water sector

Sri Lanka, despite its abundant water resources, faces significant challenges due to the uneven distribution of rainfall across regions and seasons. The dry zone, encompassing approximately 80% of the country's land area, receives an annual average rainfall of about 2,000 mm. However, this precipitation is not evenly distributed throughout the year, leading to a heavy reliance on seasonal water storage and irrigation infrastructure to meet both drinking water and agricultural demands. Extreme weather events, such as prolonged droughts, further diminish water availability by reducing both surface and groundwater recharge rates.

Under the RCP 8.5 climate projections for 2030 and 2050, the dry and intermediate zones are expected to experience increased evapotranspiration and decreased seasonal rainfall, compounding water scarcity challenges for both drinking water and agriculture. These projections indicate a heightened vulnerability for the dry zone, where rising temperatures and erratic rainfall patterns may further exacerbate resource limitations. Figure 3.7 is a map that shows the drought risk on freshwater resources.



Source: MoE (2022)

Figure 3.7: Drought risk on freshwater resources

Studies have identified 44 Divisional Secretariat Divisions (DSDs) at high risk for drought, with an additional 125 DSDs classified as moderately vulnerable, affecting both rural and urban populations within these areas. In flood prone areas, contamination of drinking water remains a significant concern. Flooding can increase turbidity, microbial contamination, and salinity in water systems, further complicating access to safe drinking water. Coastal districts also face salinity intrusion into aquifers, a problem worsened by rising sea levels. Further, this can exacerbate saltwater intrusion into coastal aquifers, contaminating drinking water sources and making groundwater increasingly saline, particularly during dry periods.

With 90.8% of Sri Lanka's renewable freshwater resources already consumed, primarily driven by irrigation, population growth, and urban expansion, competition for water resources has intensified. Areas susceptible to seasonal drought are particularly affected, with additional pressure arising from the need to sustain both drinking water supplies and agricultural productivity.

The monsoonal variability creates regional imbalances in water availability, with the wet zone receiving consistent rainfall and the dry zone frequently facing water scarcity. The Mahaweli river, Sri Lanka's largest river, remains crucial for agriculture, hydropower and domestic use, while balance 102 river basins across the island further supplement water resources.

Agriculture, especially rice cultivation, as a key sector of the Sri Lankan economy is heavily dependent on reliable water resources. Irrigation infrastructure, including ancient tanks and cascade systems, plays a crucial role in maintaining agricultural productivity, particularly in the dry zone. However, rapid urbanization and industrial expansion, especially in major urban centres have increased water demand, placing further strain on resources and highlighting the need for effective water management policies.

3.2.2.5 Biodiversity sector

Sri Lanka along with the Western Ghats is one of the world's 36 biodiversity hotspots and has the highest species density for flowering plants, amphibians, reptiles and mammals. Effective conservation efforts focusing on habitat protection, restoration and climate adaptation are vital to safeguarding these resources.

Sri Lanka's diverse ecosystems provide vital economic value, essential products and ecological services, but face significant threats such as habitat loss, fragmentation, invasive species, deforestation, pollution and climate change. Climate impacts like drought, bushfires, cyclones, ocean acidification, sea level rise and global warming threaten biodiversity, potentially leading to land degradation, reduced water supply and lower agricultural productivity. These changes may increase extreme weather events like cyclones, floods and landslides.

Sri Lanka's geography and biological characteristics make it more sensitive to climate change. River flooding, landslides, and erosion threaten the montane zone. Ecosystems vulnerable to climate change are montane forests and grasslands located in high altitudes (Iqbal et al., 2014). These extreme climatic events have profound impacts on life on earth, the natural environment and the world economy (Easterling et al., 2000).

Sri Lanka's wildlife, including several vulnerable species, is significantly impacted by climate change. The Asian Elephant (*Elephas maximus*) faces habitat loss due to agricultural expansion and climate disruptions, leading to increased human-elephant conflicts as they move closer to settlements in search of food. The *Panthera pardus kotiya's* prey availability and habitats in central regions are affected by rising temperatures and altered ecosystems. The Purple-faced Leaf Monkey (*Trachypithecus vetulus*), endemic to Sri Lanka, is highly dependent on forest habitats in the wet zone, where changes in rainfall patterns affect foliage availability and habitat quality. The Sri Lankan Sloth Bear (*Melursus ursinus inornatus*) faces food scarcity, particularly fruit, due to climate change. The Hump-nosed Lizard (*Lyriocephalus scutatus*) is sensitive to temperature and humidity changes in the wet zone. Climate change has also

disrupted the distribution of butterflies and bees (Karunaratne & Edirisinghe, 2008; Matos et al., 2013;). A higher species richness of butterflies occurs in the foothill areas and several species are restricted to specific climatic zones, types of forests or grasslands (Poorten, 2012) and one of the major threats to butterflies in Sri Lanka includes natural factors such as prolonged droughts.

Sri Lanka's endemic odonates are primarily found in the lowlands of the southwest and higher elevations, with many species living in streams during their larval stages. Each species is adapted to specific types of streams and the species well adapted to these environments might be affected by longer periods of drought. As a result, odonates are used as indicators for monitoring the effects of climate change on ecosystems.

The majority of the endemic and threatened amphibians are confined to the wet zone and especially to the montane ecosystem. The distribution of these species is determined by the dependence on loose, moist, shaded soil in which their eggs are deposited. The critical humidity dependence of *Philautus* eggs makes them vulnerable to even short periods of desiccation. Climate change and warming could therefore place this fauna at risk, although arboreal nesters appear to be more immediately threatened than ground nesters (Miththapala, 2015) Land snails are generally considered to be very sensitive to climate change. A lack of living specimens of some of the land snails is attributed to the dry weather conditions in certain areas of the lowland wet zone.

The decline of populations of several threatened plants have adapted to seepage environment which suggests a strong possibility that climate change has affected populations of those plants by making unfavourable moisture regimes, temperature extremes and the spread of bush fires during the dry season.

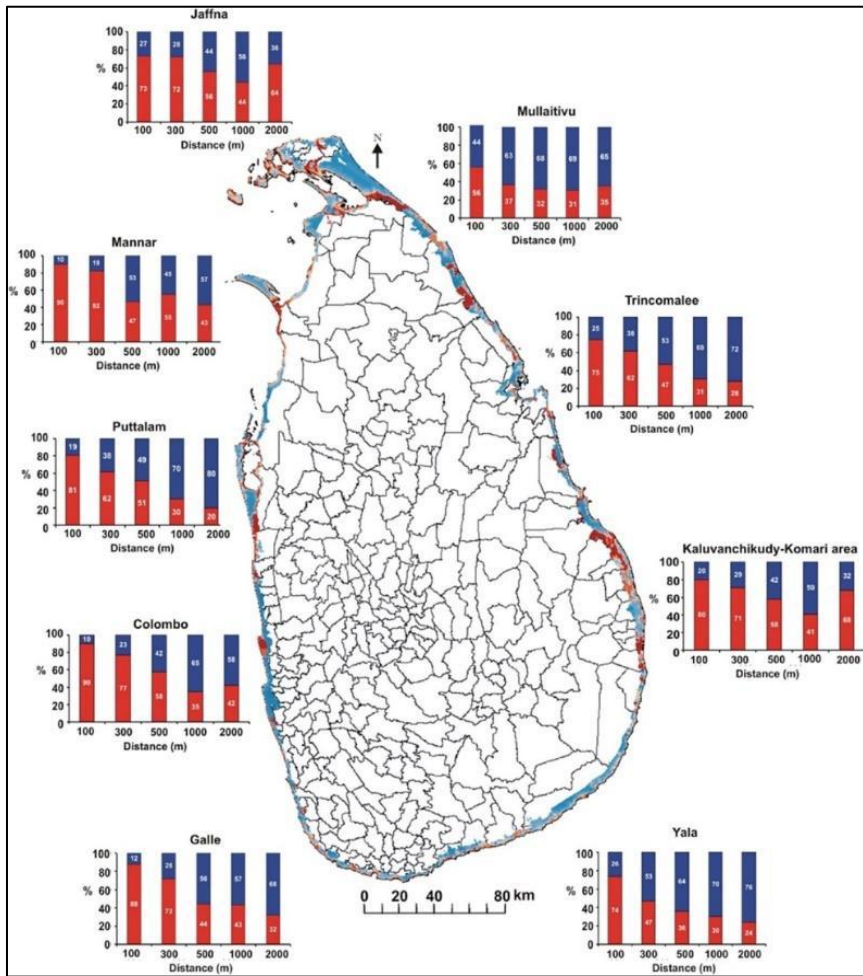
The freshwater fish are the most vulnerable taxonomic group to climate change as the endemic and most of the threatened freshwater species are found in streams outside the protected area network. Thus, extended drought and sedimentation of water bodies caused by landslides may trigger the decline of populations.

Despite government policies and regulations aimed at mitigating deforestation and protecting ecosystems, limited financial and human resources hinder effective monitoring and conservation efforts. Invasive species also pose a risk as they rapidly adapt to climate shifts.

3.2.2.6 Coastal and Marine sector

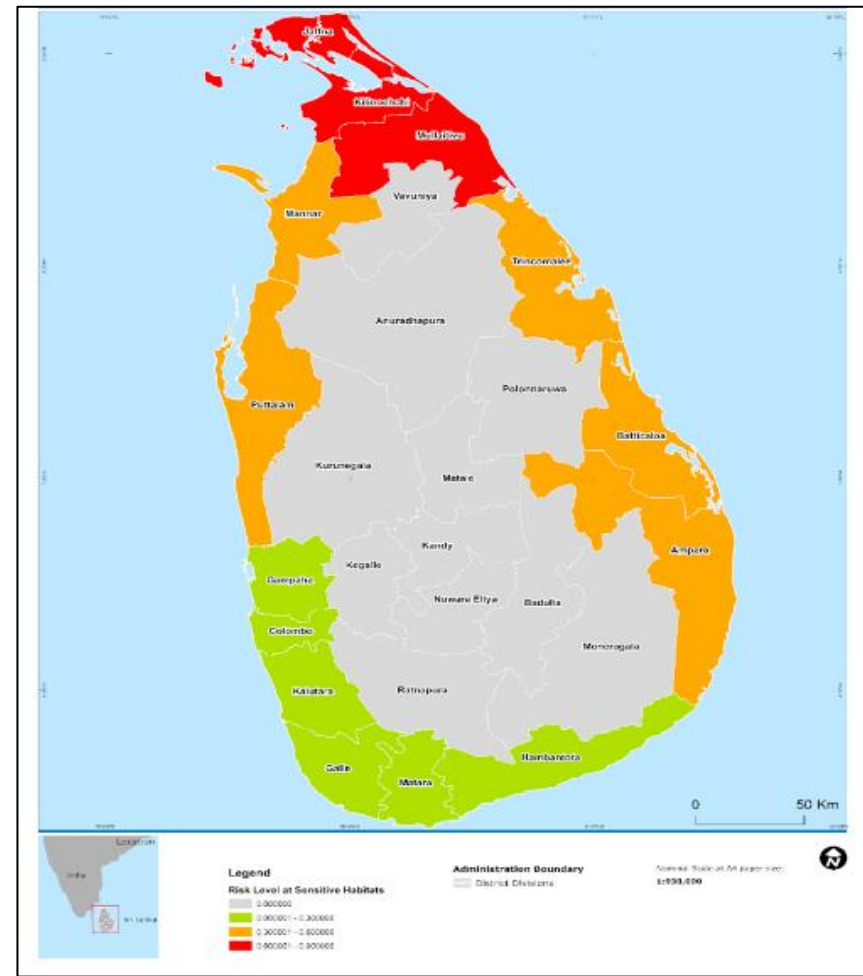
Sri Lanka is vulnerable to sea-level rise and susceptible to its combined effects with storm surges. Besides the increased risk of rapid-onset disasters, sea-level rise is already affecting coastal communities through the salinization of soils and groundwater, which has led to the abandonment of coastal agriculture and deterioration of freshwater sources critical for drinking and irrigation (ADB & World Bank, 2021).

Figure 3.8 shows the vulnerability index map showing the percentage of vulnerable and less vulnerable area in Sri Lanka along the coastal line. The percentage of vulnerability is depicted in red and blue, with less vulnerable areas depicted in blue and high vulnerability is depicted in red. Vulnerability is based on the distance of 100, 300, 500, 1000 and 2000 meters away from the coastline.



Source: Satyanarayana et al. (2017)

Figure 3.8: Vulnerability Index Map



Source: MoE (2022)

Figure 3.9: Coastal sector risk to sea level rise based on inundation of sensitive coastal habitats in coastal district by 2030

As per Figure 3.9 Jaffna, Mullaitivu and Kilinochchi districts exhibit a high risk of inundation of sensitive coastal habitats due to sea level rise by 2030. Further, low-lying coastal wetlands of these districts are at a high risk from climate change impacts with Kilinochchi and Batticaloa districts showing the highest risk to coastal populations. Over 90% of the coastline is highly vulnerable to climate change impacts such as erosion, inundation, and habitat loss, putting coastal infrastructure and livelihoods at risk. Moreover, as the populations and development activities in the coastal area increased, the vulnerability to sea level rise also intensifies simultaneously causing more and more damage to settlements, infrastructure and livelihoods. Although mangroves provide some protection, they currently cover less than one-third of the coastline.

Coral reefs, mangroves, seagrass beds and salt marshes are highly sensitive to climate change impacts, with rising temperatures and sea levels posing significant threats. Coral reefs face bleaching and habitat loss due to elevated sea surface temperatures. Mangroves, critical carbon-dense ecosystems, are threatened by sea level rise, changing air and ocean conditions, impacting their resilience and carbon sequestration ability. Seagrass beds, vital in shallow marine environments, are declining due to climate change effects and anthropogenic factors such as sedimentation and eutrophication, making them highly vulnerable. Similarly, salt marshes, important blue carbon sinks, are at risk from rising sea levels, extreme weather and salinity changes, which can reduce their ability to store carbon and sustain biodiversity. Safeguarding these ecosystems is crucial for mitigating climate impacts and maintaining their ecological and carbon sequestration functions.

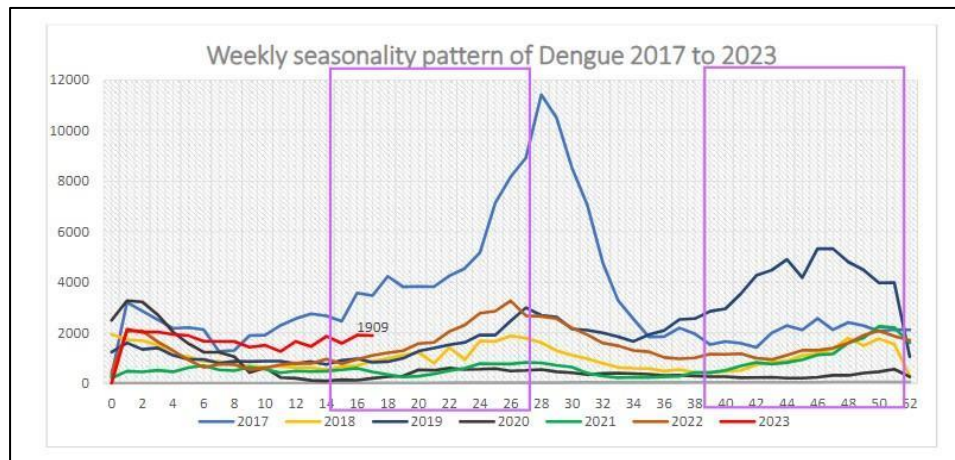
3.2.2.7 Health sector

Health is influenced by climate change through various channels, including direct exposure to extreme weather and heat events as well as indirect impacts and effects on physical and mental health.

Rising temperatures increase heat stress, heightening the risks of heat-related illnesses and mortality. These impacts are particularly severe for the elderly, people with chronic diseases and outdoor workers. Higher temperatures can also shift the distribution of density, and behaviour of vectors responsible for climate sensitive vector borne diseases. Extreme weather events raise the risk of infectious diseases and mental health challenges for affected populations. Heatwaves could increase mortality and morbidity, with projections suggesting that Sri Lanka could see a 40% rise in heat-related health issues.

Vector borne diseases spreading into new areas with changing patterns of local climate is a potential health hazard that needs close attention. Increasing temperatures have a positive correlation with disease occurrences. Rainfall is one of the principal climatic factors influencing mosquito population, because it increases the extent of mosquito vector breeding sites. Rainfall also modifies the temperature and relative humidity which influence for higher longevity and vector survival. The incidence of dengue increased 20-fold from 2000 to 2012, and a further 3-fold from 2012 to 2019. Climate projections for 2030 and 2050 show an increase

in rainfall during the southwest monsoon in the wet zone and a positive temperature anomaly across the country, potentially leading to a significant rise in dengue outbreaks.



Source: WHO (2017)

Figure 3.10: Seasonal pattern of Dengue in Sri Lanka 2017-2023

Sri Lanka remains at risk for malaria reintroduction and transmission. Formerly malaria-endemic areas in Sri Lanka indicates that climatic factors particularly temperature, rainfall and relative humidity remain conducive to potential malaria outbreaks. According to the risk assessment, all the districts in Sri Lanka indicate a moderate risk while Colombo and Galle districts have a low risk.

A moderate risk level is shown by majority of districts in Sri Lanka for leishmaniasis. However, the districts of Anuradhapura, Hambantota, Polonnaruwa, Kurunegala and Matara in Sri Lanka had relatively higher risk levels for leishmaniasis than the rest.

Leptospirosis is a climate sensitive zoonotic disease which has public health significance in Sri Lanka. Infections are reported throughout the year and outbreaks commonly occur following rainfall due to the higher possibility of contamination of water by infected rodent urine. Seasonal variability is clearly seen in disease occurrence, as *Leptospira* infections peak following the two monsoons. The predicted temperature rise and rainfall increase in the wet zone by 2030 and 2050 as per the RCP 8.5 scenario is expected to further trigger the risk for leptospirosis in the urban and suburban areas.

Climate change will affect food production, especially cereal crops due to changes in temperature, rainfall patterns, soil moisture and fertility. Situations of food insecurity as a result of climate change would lead to widespread nutritional issues mainly affecting children and pregnant mothers.

Over the years, adverse health impacts resulting from floods have been on the rise in the country. Landslides pose significant risks, leading to fatalities, injuries and disabilities as immediate adverse health consequences. Additionally, indirect health effects encompass mental health challenges.

Climate-sensitive non-communicable diseases (NCDs) are a category of chronic diseases that are influenced or exacerbated by climatic conditions, including extreme weather events,

temperature variations, air quality, and other environmental factors. Key climate-sensitive NCDs include cardiovascular and respiratory diseases, heat-related illnesses, and mental health disorders. Climate-sensitive NCDs hold particular importance for Sri Lanka due to the country's vulnerability to climate change impacts, its high burden of NCDs, and the socio-economic implications these diseases entail.

Considering the vulnerability assessments and projected climate change effects in Sri Lanka, the following adverse health impacts have been prioritized for adaptation:

- a) Morbidity and mortality due to natural disasters such as floods and landslides
- b) Morbidity and mortality due to climate sensitive vector borne diseases
- c) Heat related adverse health outcomes
- d) Nutrition related adverse health outcomes
- e) Climate sensitive non-communicable diseases
- f) Morbidity and mortality due to release of air pollutants

3.2.2.8 Urban Planning and Human Settlement sector

The Multidimensional Vulnerability Index based on UNDP's National Citizen Survey 2022-2023 ranked Puttalam as the district with the highest vulnerability, with an incidence of 71.8%. Yet referring to the highest population share, Gampaha and Colombo districts (1.37 and 1.23 million population respectively) have the highest multidimensionally vulnerable population.

The climate change impacts, risks and vulnerabilities of the Updated National Physical Planning Policy for 2048 are as follows:

- The lands in mid plains of the Western, North West, North Central, Eastern and the Southern provinces are the most desirable locations for human habitans under the present state of development and the prevalent climatic conditions.
- Only one quarter of Sri Lanka is free from the effects of landslides, frequent floods and other natural disasters, and is geographically suitable for development. Out of that extent, a large area still does not have basic infrastructure required for a living environment.
- Even though there is a higher concentration of infrastructure in the Western province, many parts of it are prone to floods, consist of fragile ecosystems and may need heavy investments for disaster migratory measures.

3.2.2.9 Tourism sector

Tourism is one of the most important sectors for Sri Lanka, significantly contributing to the country's socio-economic development. A large segment of the tourism sector is concentrated in coastal areas, making it highly vulnerable to various climate hazards. These hazards include sea-level rise, which heightens the risk of coastal erosion and storm surges, as well as river flooding, extreme rainfall and rising temperature.

Despite its importance, limited research has been conducted on how increased climate variability and extreme weather events could impact Sri Lanka's tourism economy specifically.

This gap in knowledge is concerning, as the country is likely to face significant adaptation costs to safeguard its tourism sector against climate risks.

The NAP identifies significant impacts, risks, and vulnerabilities posed by climate change. Key impacts include rising temperatures, which threaten outdoor tourism activities and health, and increased frequency of extreme weather events that can damage infrastructure and disrupt access to tourist sites. The sector is also vulnerable to biodiversity loss, diminishing the natural attractions essential for tourism. Economic risks include potential revenue losses and job insecurity for those dependent on tourism-related activities. To address these challenges, the NAP emphasizes the need for resilient infrastructure, sustainable practices, community engagement and the integration of climate considerations into tourism planning to ensure long-term sustainability and competitiveness in a changing climate.

3.3 Adaptation priorities and barriers

There are several barriers that hinder the implementation of adaptation measures across the sectors. Among them are the gaps on information, institutional & coordination, resource mobilization and progress monitoring:

- a) Limited human resources and technical expertise and capacity within institutions to, implement, and monitor the adaptation measures.
- b) Coordination among institutions could be improved. Enhanced collaboration between governmental agencies would help ensure a more cohesive and integrated approach to climate action.
- c) Insufficient baseline data and lack of reliable information on vulnerabilities. Data management systems, tools for adaptation need to be strengthened.
- d) A lack of comprehensive research on specific climate impacts, adaptation measures.
- e) Limited financial resources hinder the implementation of climate action plans/programmes.

3.4. Adaptation policies, strategies, plans, goals and actions to integrate adaptation into national policies and strategies

3.4.1 Agriculture sector

Sri Lanka is prioritizing Climate-Smart Agriculture (CSA) to enhance resilience against climate change. The National CSA Guidelines, developed in 2019, have achieved 50% progress, with a full integration target by 2024 through an inventory of 40 CSA technologies. Additionally, Good Agricultural Practices (GAP) aim for 100% adoption by 2030, supported by multilingual climate-based advisories. Initiatives such as crop-livestock systems and home gardening (targeting 75% implementation by 2025) are being promoted in vulnerable areas to improve agricultural resilience.

The country is advancing sustainable practices like Integrated Pest Management (IPM) and Integrated Plant and Nutrition Systems (IPNS), focusing on vulnerable dry zones and nationwide adoption. Efforts are underway to develop pest- and disease-resistant crop varieties

and expand IPM technologies. GAP certifications are being increased in climate-sensitive areas to enhance resilience and sustainability of agricultural products.

To address rising temperatures, water scarcity, and soil salinity, Sri Lanka is developing climate-resilient crop varieties, including heat, drought, flood and salt-tolerant crops. The DOA has released multiple pest- and disease-tolerant varieties, excluding susceptible crops from approval. Additionally, genes are being incorporated into crops to enhance resistance to pests and diseases, safeguarding food security.

Sri Lanka is revisiting Agro-Ecological Regions (AERs) to align agriculture with changing climate conditions. Expansion of agro-meteorological networks, improved data collection, and soil moisture studies are enabling region-specific, climate-resilient agricultural practices.

Efforts to strengthen sustainable land and water management include fertigation systems, alternative planting methods, and farm-level rainwater harvesting, with targets of full implementation by 2030 and 75% farm coverage by 2025. These initiatives aim to conserve resources and improve resilience to water scarcity.

The country has enhanced early warning systems and climate forecasting for the Maha and Yala seasons, providing farmers with timely advisories to make informed decisions. Expanded crop insurance since 2018 now covers six major crops, mitigating risks from climate-induced losses. Together, these measures strengthen agricultural resilience and reduce vulnerabilities to climate change.

3.4.2 Fisheries sector

Adaptation measures in the fisheries sector: adopting ecosystem-based fisheries management, expanding aquaculture and culture-based fisheries, breeding climate-resilient species for aquaculture, enhancing safety at sea, improving early warning systems, diversifying livelihoods and conducting targeted research on climate impacts are described below.

Protecting and restoring critical ecosystems, such as coral reefs, mangroves and seagrasses, is vital for maintaining fish habitats and mitigating climate impacts. Efforts like mangrove restoration and coral reef rehabilitation enhance the resilience of fisheries, improve ecosystem productivity, and protect coastal communities from extreme weather events.

Strengthened fisheries management through sustainable fishing practices, adaptive strategies, and better regulation is a priority. This includes demarcating marine protected areas, sustainable fish stock management and fishing quotas to control overfishing.

Promoting alternative livelihoods, such as eco-tourism and aquaculture, can reduce pressure on fish stocks while providing sustainable income sources for coastal and inland communities. Improving aquaculture resilience through sustainable practices and infrastructure supports a stable fish supply.

Investing in climate research, including monitoring sea temperatures, fish stocks, and water quality, is essential for anticipating climate impacts. Research also supports the development of climate-resilient species and innovative aquaculture methods suited to changing environments.

Enhancing the adaptive capacity of fishermen and aquaculture farmers through training, awareness programs and early warning systems is critical. These efforts focus on educating communities about climate risks and promoting the adoption of adaptive technologies and sustainable practices.

3.4.3 Livestock sector

Adaptation priorities in livestock sector focus on building climate resilience in ruminant farming, managing poultry and swine farms, and sector-wide research, training and capacity building. A key emphasis is on developing climate-resilient livestock breeds, improving feed quality, and optimizing management systems. These efforts should be integrated into national agricultural and livestock development plans to mitigate climate-induced stress such as heat, drought, and diseases. Collaboration with international organizations and local universities is essential to drive research and innovation.

Guidelines and incentives should be established to encourage farmers to adopt climate-resilient infrastructure, such as controlled housing systems for poultry and swine, improved water storage and rainwater harvesting systems. Incorporating these measures into national agricultural infrastructure plans will reduce climate vulnerabilities.

Awareness and capacity-building programs are crucial to help farmers adapt to climate change. National programs should provide training on better management practices, such as heat stress management, water conservation techniques, and the use of climate-resilient breeds. Public-private partnerships (PPPs) can facilitate grassroot level training and outreach.

Strengthening policy frameworks is essential for supporting climate-smart livestock practices. Policies should promote the use of indigenous breeds that are more resilient to local climate conditions, enforce sustainable farming regulations and offer financial incentives for adopting climate-smart methods.

Water scarcity is a significant challenge, particularly in dry and intermediate zones. Policies should prioritize water-efficient livestock farming by promoting micro-irrigation, better water storage systems and rainwater harvesting. Mobilization of financial support for water infrastructure projects, such as reservoirs, will help mitigate water scarcity.

Research and development efforts should focus on drought-resistant forage and fodder species, as well as sustainable grazing systems. Strengthening feed supply chains and improving feed quality during dry spells will help maintain livestock productivity and health.

Establishing national systems to monitor climate impacts on livestock and developing early warning systems for extreme weather events is vital. Linking these systems to national meteorological agencies will provide farmers with actionable insights to adjust practices and reduce climate risks proactively.

3.4.4 Water sector

Sri Lanka has made notable strides in strengthening climate resilience and promoting sustainable water management through Integrated River Basin Management (IRBM) across 15 priority river basins. Key milestones include completing 10 vulnerability and risk assessments

under the Climate Resilience Improvement Project (CRIP) and six integrated river basin management plans, with a target of 15 by 2026. Efforts have also resulted in six finalized water resource development plans, aiming for completion by 2030.

Water security initiatives in drought-prone areas have achieved significant progress, with 70 new drinking water projects and 897 community-based initiatives launched, meeting 49% and 22% of their respective targets. Rainwater harvesting (RWH) systems and shallow wells have improved water retention, yet challenges persist in meeting water quality standards and funding for infrastructure upgrades.

Wastewater reuse for non-potable applications is gaining traction through legislative reforms and awareness campaigns. However, expansion of wastewater reuse practices and testing facilities requires further investment. Saline intrusion mitigation has progressed with completed feasibility studies for key rivers. Daily monitoring systems and inter-agency coordination are in place, yet regulatory hurdles and partial coverage remain challenges.

Capacity building has focused on climate-resilient water safety, rainwater harvesting programs and public awareness campaigns. Gender-responsive training programs are being conducted; further resources are required to enhance implementation of gender responsive measures.

Agricultural water resilience efforts have restored large number of minor tanks, rehabilitation of canals, and initiated groundwater recharge systems. Micro-irrigation systems have reached 90% of their target. Pilot studies on water allocation and irrigation technology adoption are planned to boost efficiency.

River flood risk mitigation initiatives have advanced with hydro-meteorological stations and manual early warning systems in five priority basins. Digital elevation models (DEMs) are available for two basins, with work underway for three more. Flood infrastructure studies and digital mapping enhancements aim to reduce vulnerabilities by 2030.

Overall, Sri Lanka has made significant progress in climate-resilient water management, but financial constraints, technical limitations, and regulatory challenges must be addressed to ensure sustainable water resource management and climate resilience across the country.

3.4.5 Biodiversity sector

Sri Lanka, a biodiversity hotspot, has implemented diverse strategies to combat climate change while protecting its rich ecosystems. The updated National Policy on Climate Change in 2023 emphasizes biodiversity conservation as a critical component of climate adaptation and mitigation efforts. Policies like the Environmental Sensitive Area (ESA) Policy (2022) aim to identify and conserve biodiversity outside protected areas through Other Effective Area-based Conservation Measures (OECMs). Protected area networks play a vital role in safeguarding habitats and species from human encroachment and also climate impacts. The National Biodiversity Strategic Action Plan (NBSAP) and National Physical Planning Policy further integrate biodiversity conservation into national planning and note climate change as a challenge.

Ecosystem-based Adaptation (EbA) initiatives are central to Sri Lanka's climate strategies, leveraging nature-based solutions to enhance resilience. Reforestation and landscape

rehabilitation efforts, restoration of degraded lands in protected areas, improve habitat connectivity and ecological stability.

Community-based conservation is another cornerstone of Sri Lanka's biodiversity protection strategy. Programs like the Sri Lanka Community LULUCF Program engage local communities in sustainable ecosystem management, reforestation, and human-wildlife conflict mitigation. These initiatives enhance biodiversity while providing livelihoods for communities. Urban wetland conservation has also gained prominence, with Colombo being recognized as a Ramsar Wetland City in 2018 for its innovative flood risk management strategy. Urban planners have integrated wetlands into the city's flood reduction system and master plan, showcasing the effective use of natural buffers to reduce climate risks.

Forest conservation and reforestation efforts aim to reduce deforestation and promote sustainable forest management. These efforts target the protection of mangroves, rainforests and wetlands, which are critical for carbon sequestration and climate regulation.

Sri Lanka's integrated approach is supported by a robust policy framework, innovative projects, and active community engagement, ensuring the sustainable use of natural resources and enhanced resilience to climate impacts.

3.4.6 Coastal and Marine sector

Sri Lanka's Coastal Zone and Coastal Resource Management Plan (CZ&CRMP) for 2024-2029 outlines a comprehensive approach to climate adaptation through various strategies aimed at enhancing the resilience of coastal ecosystems and communities. Among the key strategies, erosion control and shoreline stabilization are critical, particularly in the Southern and Western coastal regions where severe erosion has occurred. Both engineering solutions, such as breakwaters, and softer interventions have been deployed to protect vulnerable communities from the impacts of coastal erosion.

As part of broader climate adaptation efforts, coastal wetland rehabilitation, including the expansion of mangroves, play a vital role in strengthening flood control and coastal defence mechanisms. Mangroves, along with other wetlands, are being integrated into climate resilience strategies due to their ability to mitigate storm surges and enhance biodiversity. Early warning systems for coastal communities have also been implemented to prepare for extreme weather events with integration into broader disaster response frameworks.

To address the impacts of climate change on marine ecosystems, Sri Lanka has also intensified its efforts to protect and restore coral reefs, which are crucial to the coastal economy and biodiversity. The expansion of coral restoration projects, such as those in the Hikkaduwa Marine National Park and the Bar Reef Marine Sanctuary, includes the establishment of coral nurseries and transplanting healthy coral into degraded areas. Additionally, local fishing communities are being trained in coral health monitoring and sustainable harvesting practices to ensure long-term ecosystem resilience.

Another key component of Sri Lanka's climate adaptation strategy is the expansion of Marine Protected Areas (MPAs). The designation of new MPAs, such as the Mirissa and Talawila Sanctuaries are planned to safeguard critical biodiversity hotspots and promote sustainable marine resource use. These MPAs form a crucial part of the country's efforts to protect marine ecosystems from the escalating threats posed by climate change.

In addition to marine conservation, Sri Lanka has prioritized the sustainable use and restoration of mangrove and seagrass ecosystems. The National Policy on Conservation and Sustainable Utilization of Mangrove Ecosystems (2020) and the National Strategic Action Plan (2022–2026) provide a framework for preserving these critical ecosystems, emphasizing their role in coastal defense and carbon sequestration. These policies are supported by scientific restoration practices and training programs aimed at enhancing the effectiveness of mangrove and seagrass restoration efforts, ensuring they continue to provide vital ecosystem services in the face of climate change.

3.4.7 Health sector

Sri Lanka's health sector adaptation strategies aim to enhance climate resilience through a variety of policy-level initiatives focused on integrating climate resilience actions across related sectors by 2030. Key strategies include the development of the Heat-Health Action Plan (HHAP), the National Strategic Plan for Health, Environment and Climate Change (NHSPEC) and guidelines to establish Green and Healthy Hospitals. Additionally, the country is working on an action plan to address the health burden caused by air pollution, aiming to create a comprehensive framework for mitigating climate-induced health risks.

The health sector is also focused on improving its capacity to manage NCDs and health conditions that are exacerbated by climate change. This includes identifying diseases expected to worsen due to climate impacts, developing management and prevention guidelines, and strengthening the public health system's ability to address climate-related health issues. Special attention is given to vulnerable groups, such as the elderly and children, with a roadmap for managing climate-induced NCDs. Research capacity is also being strengthened to generate evidence on the relationship between climate change and health impacts, further enhancing the sector's ability to respond effectively.

To address the worsening issues of malnutrition and under-nutrition which are exacerbated by climate change, Sri Lanka is working to develop early warning systems related to food availability and strengthen social welfare systems to support vulnerable populations. Additionally, surveillance systems for climate-sensitive diseases, such as dengue and malaria, are being improved, with early warning systems based on climate forecasts and capacity-building initiatives for local authorities and public health systems. The government is also focusing on reducing morbidity and mortality from extreme weather events by strengthening early warning systems, risk assessments and health preparedness for climate-related emergencies at all levels of the health sector.

3.4.8 Urban Planning and Human Settlements Sector

Sri Lanka's National Physical Planning Policy envisions a "Planned, Sustained, and Prosperous Nation by 2048" with a focus on creating a resilient, inclusive built environment. The policy promotes smart cities that support economic growth, social well-being and the optimal use of physical, social, economic and environmental resources. The policy's core principles emphasize a resilient and inclusive environment that fosters economic growth, responsible resource use, and development that meets the needs of future generations. Climate change adaptation is embedded in the policy's long-term goals, highlighting the need for responsive strategies to natural hazards and sustainable development.

The local area planning process, guided by the UDA, is designed to integrate expert, traditional and local knowledge into planning decisions. This process, which involves consultations with diverse stakeholders, emphasizes context-specific strategies shaped by local needs and characteristics. While many of the actions in local area plans may not explicitly target climate adaptation or mitigation, they contribute to resilience-building by promoting resource-efficient development and addressing local environmental challenges. These plans, including those gazetted between 2021 to 2023, are aligned with broader goals of sustainability and climate resilience.

The National Disaster Management Plan (NDMP) for 2023-2030 focuses on building resilience through risk-sensitive development planning. The plan integrates climate change and ecosystem-based approaches to disaster risk reduction, such as Eco-DRR and ecosystem-based adaptation (EbA). Nature-based solutions (NbS), such as the protection of mangroves and green infrastructure, are promoted to reduce disaster risks, drawing on traditional practices such as the ancient tank cascade systems in dry and intermediate zones. The NDMP also addresses emerging disasters, including health-related epidemics and human-wildlife conflict, ensuring a comprehensive approach to disaster risk reduction and climate resilience across the country.

3.4.9 Tourism sector

Sri Lanka is enhancing resilience in its tourism sector by adopting sustainable practices and improving risk preparedness, especially in vulnerable destinations. Comprehensive studies are planned to assess the impacts of climate change on tourism, focusing on carrying capacities and at-risk facilities, while promoting adaptation measures. Diversification of tourist attractions, such as cultural, marine and adventure tourism, is encouraged to reduce dependency on vulnerable locations. Guidelines for sustainable tourism practices will be developed, and looking to increase certification of establishments under the National Sustainable Tourism Certification Scheme aligning with global standards.

Risk reduction and transfer mechanisms are key to building resilience against climate-induced disasters in tourism. Strengthened early warning systems, capacity-building initiatives and coastal protection measures, in partnership with the Department of Coast Conservation and Coastal Resources Management and Marine Environment Protection Authority (MEPA), aim to mitigate erosion, flooding and other climate impacts in vulnerable coastal areas. Coastal tourism zonal planning is being expanded to integrate climate risks into development, while a climate-inclusive insurance scheme has been proposed to provide financial security to the sector in managing climate-related challenges.

To further enhance resilience, Sri Lanka is incorporating green building design principles into all new tourism constructions and refurbishments. The Green Building Guidelines are being reviewed and updated to include climate change and ecological considerations tailored to the tourism industry. These efforts aim to safeguard tourism assets, protect natural and cultural heritage, and foster a sustainable tourism environment that benefits both visitors and local communities.

3.5 Progress on implementation of adaptation

The progress of adaptation actions has been reported under Section 2.4 of Chapter II.

3.6 Monitoring and evaluation of adaptation actions and processes

As mentioned in Section 2.1 of Chapter II, the same institutional arrangements for planning, implementation, and monitoring apply for adaptation actions. Specific sectoral lead agencies and key supporting agencies are responsible for the implementation and monitoring of adaptation progress as indicated in Table 3.1.

Table 3.1: Responsible agencies for sector specific adaptation efforts

Adaptation Sector	Lead agency	Key Agencies
Agriculture	DoA, MET, DAPH	MoIrri, LUPPD, MASL, DAD, TSHDA, PDoA, ID & TRI, RRI, CRI, Coconut Cultivation Board (CCB), SRI, PRI, DEA, MASL, Plantation, HORDI,
Fisheries	DFAR	NARA, CC&CRMD, MEPA, MoPC&LG, NAQDA, FD, SLCG, DS
Livestock	DAPH	MoA, PDAPHs, NLDB, VRI, Academia, Milk Processing agencies
Water	MoIrri, ID, DMC, MoE, NWSDB, WRB	MoWS, ID, LUPPD, MoE, NPPD, DAD, MASL, NWSDB, IWMI, WRB, IU
Biodiversity	MoE (BDS), DNBG	FD, DWC, CC&CRMD, CEA, MEPA, MASL, MD, DMC, NARA, NWPEA, Academia & researchers, NGOs
Coastal and Marine	CC&CRMD, SD, NARA,	CC&CRMD, DMC, MD, SLPA, SLN, NARA, SD,
Health	Environmental health, Occupational health and Food safety (EOH) Directorate of MoH)	MoH (Other relevant units), MoE, CEA, MD, Provincial Health Authorities, LAs, Academia
Urban Planning and Human Settlement	NPPD, UDA, NBRO, CC&CRMD and DMC	MoUD&H, MoPC&LG, MoH, UDA, ID, SLLDC, NBRO, LAs
Tourism and Recreation	Ministry of Tourism	MoE, MoPC&LG, SLTDA, UDA, CEA, MEPA, CC&CRMD, NARA, SLSDC, CCF, DWC, FD, DMC, NBRO, MD

3.7 Information related to averting, minimizing and addressing loss and damage associated with climate change impacts

3.7.1 National circumstances and institutional arrangements

The devastating impact of the 2004 Asian Tsunami served as a wake-up call for Sri Lanka, highlighting the critical need for a robust policy and strategic frameworks to address such disasters. In response, Sri Lanka enacted the National Disaster Management Act No. 13 of 2005, which became a cornerstone for institutionalizing disaster management in the country. This legislation paved the way for the formulation of the National Policy on Disaster Management in 2010, providing a comprehensive framework to address disaster risks and enhance resilience.

The increasing frequency and intensity of disasters such as floods, landslides, and droughts, exacerbated by the impacts of climate change, further underscored the need for targeted policy

interventions. The Post Disaster Needs Assessment conducted in 2016 and 2017 respectively, underscored the possibility that climate change was a factor in Sri Lanka's increasing exposure to disasters. Further NDCs specific to L&D were submitted in 2021 and activities are further outlined in the NDC IP. The National Policy on Climate Change revised in 2023 specifically mentions the need to develop synchronized and seamless early warning systems for social and sectoral protection and resilience. The National Disaster Management Plan 2023 – 2030, was updated in 2023 and highlighted the potential for new and emerging risks due to climate change. It further noted the need for comprehensive loss and damage, recovery needs assessments.

The Risk Info database provides multiple disaster related data layers while the DesInventar database contains information on losses and damages from specific events. Through the Global Facility for Disaster Risk Reduction and Recovery (GFDRR) funding support, the Sri Lanka Damage and Loss Assessment System was developed. However, this system is yet to be fully operationalized and capacity building is required.

The Disaster Management Centre (DMC) is Sri Lanka's primary agency responsible for disaster management, established under the Sri Lanka Disaster Management Act. It operates under the National Council for Disaster Management (NCDM) and is tasked with implementing and coordinating national and sub-national programs aimed at reducing disaster risks and enhancing resilience with the involvement of multiple stakeholders.

3.8 Cooperation, good practices, experience and lessons learned

Sri Lanka's approach to climate change adaptation is fundamentally rooted in cross-sectoral collaboration, as detailed in the National Climate Change Adaptation Strategy and other key frameworks. These efforts aim to integrate climate change considerations across all sectors, ensuring the systematic collection, analysis and dissemination of climate data. The government is implementing essential strategies to enhance scientific understanding of climate change, build capacities at the local government level and promote the private sector's role in supporting climate resilience initiatives. Additionally, the strategy emphasizes strengthening partnerships across various sectors, including agriculture, infrastructure and health, to effectively address climate-related vulnerabilities.

International cooperation is a cornerstone of Sri Lanka's climate adaptation efforts, particularly in light of the shared challenges experienced by countries in the South Asian and Asia-Pacific regions. One of the key strategic priorities is to enhance the adaptive capacity of developing countries. In this context, Sri Lanka actively participates in regional and international collaborations aimed at strengthening climate resilience.

For instance, Sri Lanka is involved in the Asia-Pacific Adaptation Information Platform (AP-PLAT), an initiative that fosters regional cooperation in adaptation planning, the development of climate impact assessment tools and the exchange of knowledge regarding climate risks. These collaborations not only bolster Sri Lanka's efforts to enhance its climate resilience but also allow the country to contribute to and benefit from regional and global initiatives addressing climate change.

CHAPTER 4

Information on financial,
technology development &
transfer and capacity building
support needed and received

Chapter 04

Information on financial, technology development & transfer and capacity building support needed and received

4.0 Overview

Sri Lanka has established a robust policy framework for climate change mitigation and adaptation, which underpins the development of climate actions and strategies. The NDCs are categorized as unconditional and conditional based on their provision of external supports. This chapter details the identified financial, technology development & transfer and capacity building needs and presents support already received for the period of 2021 to 2023.

4.1 National circumstances, institutional arrangements and country-driven strategies

A considerable portion of the Consolidated Fund is allocated directly and indirectly through the national annual budget for respective government agencies to invest in building resilience and transition to low carbon development pathways. External funding for climate actions is received from bilateral and multilateral cooperation are managed through the General Treasury to respective government agencies and directly by the development partners in collaboration with executing entities. Support for technology transfer and capacity building also follows the same procedure.

Based on capacity building during 2021-2023, Sri Lanka implemented SDG budget tagging for the first time in its 2024 budget tagging budget allocations to specific Sustainable Development Goals (SDGs) was newly introduced in the most recent budget cycle and planned vertical dive into the SDG 13 during 2025. Sri Lanka is in the process of conducting a Climate Public Expenditure and Institutional Review (CPEIR) in collaboration with UNDP. Informed by CPEIR and further building on the Climate budget tagging, the government will adopt Climate Budget tagging at national and subnational level in 2026 budget cycle to enhance climate finance tracking.

The Technology Needs Assessment (TNA) conducted in 2014 is being updated by the Third GCF-NDA Readiness Support Project through the Food and Agriculture Organization. The updated TNA will identify the environmentally sound technologies that can help to reduce the impacts of climate change and the rate of GHG emissions. Specifically, the TNA helps to identify barriers for deployment and diffusion of technologies and address policy and legal gaps to enhance the overall enabling environment, increase the capacity of local institutions and experts, and raise public awareness of climate change issues. The TNA identified climate change adaptation needs in nine sectors; agriculture, livestock, fisheries, water, health, coastal & marine, biodiversity, tourism & recreation, urban planning & human settlements and for mitigation in six sectors; energy, transport, industry, waste, forestry and agriculture. Government, semi-government and private sector institutions including civil society organizations provide climate change related capacity building programs for students, officials and general public through various funding sources.

The detailed information on financial, technology development & transfer, and capacity building support needed are indicated in tables 4.1 ,4.2 and 4.3 and resources received are indicated in Annexes 32, 33 and 34.

4.1.1 Underlying assumptions, definitions and methodologies

Data and information on financial, technology development & transfer and capacity building support received from 2021 to 2030 and needed for future actions were compiled using data and information from government sources, UN agencies and credible publicly available documents such as donor agreements, memorandums of understanding (MOUs), and official project documents.

All financial figures reflect contributions from various financing mechanisms, including grants, loans, and technical assistance. To estimate the climate finance landscape, only projects receiving funding through official government channels were considered. Due to a lack of available information, climate finance mobilized directly by the private sector has not been included in this report. The prioritization of funding needs was determined by the priorities identified in the updated NDCs Implementation Plan (2021-2030), supplemented by focus group discussions held during the preparation of the BTR1 using Common Tabular Formats (CTFs).

4.2 Financial support needed

Sri Lanka's comprehensive financial support needs demonstrate a strategic approach to achieving both its NDCs and the broader objectives of the Paris Agreement. Electricity (Power) sector: Financial support of USD 189.9 million is prioritized for renewable energy transitions, particularly a USD 180 million rooftop solar program to install 309 MW of solar capacity and battery storage across varied beneficiaries. The program targets diverse beneficiaries including commercial, industrial, Micro, Small and Medium Enterprise and residential customers, as well as government buildings. An additional USD 9.9 million is targeted for sustainable bioenergy in the Central Highlands, reducing emissions and fostering sustainable energy.

Transport Sector: Funding of over USD 1,826 Mn supports emission reductions and resilient infrastructure, focusing on railway electrification (USD 863 million), climate-resilient roads (USD 512 million), electric bus fleet upgrades (USD 256 million), EV infrastructure (USD 171 million), and rail freight systems (USD 171 million). Urban pathways and car-free zones require USD 35 million. These initiatives aim for a 20% GHG emission reduction by 2030 while enhancing public health and urban mobility.

Industry Sector: Financial supports are needed in this sector for investments targeting decarbonization through co-generation, established eco-industrial parks, and circular economy models.

Waste Sector: Seeks USD 14 million over five years for system improvements. Key allocations include USD 2.35 million for modernizing the collection fleet, USD 1.36 million for transfer station development, and USD 1.23 million for upgrading treatment plants. The largest share, USD 3.42 million, targets dump site rehabilitation and facility upgrades. Composting facility expansion and technological upgrades require USD 0.51 million, while material recovery

facilities need USD 0.08 million to enhance recycling. These investments align with the Paris Agreement by reducing CH₄ emissions from waste dumps and advancing resource recovery and circular economy goals.

LULUCF Sector: Seeks USD 20 million over five years to complement annual domestic funding of USD 10 million. This will support advanced monitoring systems using geospatial and remote sensing technologies for better forest management, efficient afforestation and reforestation techniques, and improved nursery management and seedling production. Funding is also required for sustainable forest management practices and agro-LULUCF systems to boost carbon sequestration in agricultural landscapes. These investments align with the Paris Agreement by enhancing natural carbon sinks, ecosystem-based adaptation, and sustainable forest management.

Agriculture Sector: Requires significant funding for both mitigation and adaptation. USD 1.7 million is needed to reduce enteric fermentation emissions through improved feed and livestock breeding centers. USD 70 million is requested for biogas systems to process animal waste and generate renewable energy, with another USD 70 million for implementing precision agricultural technologies. Additionally, USD 170 million is needed for sustainable irrigation systems. The sector also seeks support for post-harvest loss reduction and water use efficiency. These investments align with the Paris Agreement by reducing emissions and enhancing adaptation through efficient livestock management, biogas, and climate-resilient farming practices. Sri Lanka needs a comprehensive strategy to mobilize climate finance for adaptation, mitigation, and loss and damage. This includes assessing financial needs, securing funding from sources like the GCF and GEF, and fostering stakeholder collaboration. Strengthening the private sector's capacity to access funds and enhancing data management for better climate monitoring and decision-making are also key priorities.

Fisheries and Livestock: Financial support is needed for climate adaptation measures in both sectors. In fisheries, funds are required for sustainable aquaculture, biosecurity, monitoring fish stocks, and strengthening early warning systems. The livestock sector needs funding for climate-smart practices, feed efficiency improvements, and resilient infrastructure. Investments in capacity-building, such as training farmers and fishers in adaptive techniques, are also essential. International financial mechanisms, grants and private sector investments are key to bridging the funding gap.

Water Sector: To meet Sri Lanka's water sector NDC targets, funding is essential for infrastructure upgrades, field data collection/testing/surveying for wellhead protection establishment, water quality assessments, community engagement programs and the implementation of Climate Resilient Water Safety Plans (WSP) and catchment management measures. NDCs 1, 7, 8, 9, and 10, managed by the Ministry of Irrigation, have faced delays due to insufficient funding. For NDC 2, funding is required for upgrading treatment plants, water quality assessments, community engagement, and implementing Climate Resilient Water Safety Plans (WSP). NDC 4, which involves constructing a testing facility for water fittings, is stalled due to budget limitations. Similarly, NDC 6, which focuses on accreditation schemes

for water sector technicians and plumbers, requires financial support for resource fees, sponsorships for low-income trainees to follow the accredited programs and purchasing toolbox, to develop the necessary skills and knowledge for sustainable water management practices. Under NDC 7, major reservoir projects, including Upstream Yatimahana (USD 70 million), Pali Aru (USD 396 million) and Nawayalawila (18% of USD 6 million for initial studies), require substantial financial support. Other projects, including the Mahaweli Water Security Investment Program, Lower Malwatu Oya Reservoir and Gin Nilwala diversion, are also facing delays due to a lack of funds.

Coastal and Marine: Key initiatives requiring support include restoring critical coastal ecosystems such as mangroves and coral reefs, which protect against storms and erosion. Investments are also needed for strengthening coastal infrastructure, including resilient harbours and early warning systems for marine hazards. Additionally, financial resources are essential for implementing fisheries management plans, capacity-building for local communities and scaling up climate-resilient aquaculture systems. International funding and bilateral partnerships are crucial to mobilize the required resources for these efforts.

Health Sector: Seeks USD 18 million to implement green and healthy hospital initiatives at ten healthcare facilities by 2030. This investment aims to develop climate-resilient infrastructure and reduce the sector's carbon footprint. Key areas include low-carbon technologies for waste management, focusing on infectious and sharps waste, and innovative solutions for liquid waste and sewerage management. These investments align with both adaptation and mitigation goals of the Paris Agreement while ensuring continued service delivery during climate events.

Tourism: Substantial financial resources for sustainable tourism infrastructure, such as eco-friendly accommodations, renewable energy, and waste management. Grants and low-interest loans are essential for building facilities that meet sustainability standards. Capacity-building for local communities and tourism operators through training programmes is crucial. Microfinance facilities are also vital for small tourism businesses lacking access to credit, enabling them to compete with other operators. Financial resources are also needed for disaster risk reduction and conservation related aspects in tourism. The provision of incentives like subsidies or tax breaks could promote sustainable practices amongst operators. Public private partnerships can enhance investments in sustainable tourism.

Table 4.1 shows the details about the financial support needed for Sri Lanka addressing climate change impacts.

Table 4.1: Financial support needed

Sector	Sub sector	Title of activity, programme, project or other	Programme/ project description	Estimated amount (climate-specific)		Expected time frame	Expected financial instrument	Type of support	Contribution to technology development & transfer objectives	Contribution to capacity-building objectives	Whether the activity is anchored in a national strategy and/or an NDC	Expected use, impact and estimated results	Additional information
				Domestic currency LKR	USD								
Energy	Renewable Energy	Accelerating Solar Energy Deployment in Sri Lanka	Accelerate RE transition by rooftop solar investment program through regulatory and structural reforms	52,677 Mn	180 Mn	2025 - 2030	Grant + Co-finance	M	1	1	NDC	Strengthening RE sector contribution to the national energy mix.	GCF 120M USD + Co-finance 60 M USD
Energy	Renewable Energy	Bioenergy development in Central Highland	Promote sustainable bioenergy development and efficient use to foster resilient green economies, ensure energy security	2,891Mn	9.9Mn	2025 - 2030	Grant	M	1	1	1	Sustainable bioenergy practices for households and SMEs and private sector involvement	
Transport	Road Transport	Climate-Resilient Road Infrastructure Program	Develop flood-resilient roads, mitigate landslides, and stabilize slopes in high-risk areas.	150bn	0.52bn	2025 - 2030	Concessional loans or grants	A	Promotes use of advanced materials for resilience against extreme weather	Provides training for engineers in climate-resilient infrastructure design	NAP and NDC	Improves connectivity and reduces climate-induced disruptions, protecting livelihoods and local economies	Targets include 50% coverage of high-risk transport routes by 2030

Transport	Electric Vehicles	EV Infrastructure Expansion Project	Installation of EV charging stations nationwide, particularly in urban centers and along major routes	50bn	0.17bn	2025 - 2030	Public-private partnerships, grants	M	Introduces advanced EV charging technologies to improve adoption	Builds local capacity for EV station management and maintenance	NDC Target 9	Transition to low-emission vehicles, reducing GHG emissions by 20%	Expansion of pilot projects completed in Colombo
Transport	Public Transport	Modernization of Public Bus Fleet	Replacement of outdated buses with fuel-efficient and electric models for public transport	75bn	0.26bn	2023 - 2030	Concessional loans or grants	M	Adoption of low-emission bus technologies for reduced GHGs	Enhances skills for operating and maintaining advanced public transport systems	NDC Target 2	Reduces emissions per passenger-kilometer, improving air quality in urban areas	Pilot electric buses operational in Colombo and Kandy
Transport	Non-Motorized Transportation (NMT)	NMT Network Development Program	Development of pedestrian pathways, bicycle lanes, and car-free zones in urban areas	10bn	0.03bn	2023 - 2030	Grants	M	Promotes urban planning with low-emission mobility solutions	Promotes awareness and stakeholder involvement in NMT initiatives	NDC Target 5	Promotes sustainable urban mobility and improving public health	Current focus includes Colombo and Galle
Transport	Railways	Electrification and Expansion of Railway Lines	Electrify and modernize railway lines	200bn	0.69bn	2024 - 2035	Concessional loans and grants	M	Integration of advanced rail technologies	Capacity building for electrified systems	NDC Target 8	Emission reduction and enhance connectivity	Pre-feasibility studies completed for key corridors

Transport	Freight	Rail Freight Development	Promotion of rail-based inland container depots and pipeline transport for petroleum products.	50bn	0.17bn	2023 - 2030	Grants, concessional loans	M	Supports logistics infrastructure improvements for low-emission freight options	Enhances expertise in rail freight logistics	NDC Target 3	Shifts freight from road to rail, reducing emissions by up to 10% in the freight sector	Initial projects identified for key industrial zones
Agriculture	Livestock	Reduce emissions from enteric fermentation	Reducing methane emissions improving feed quality, upgrading climate-resilient breeds, and establishing gene conservation facilities, promoting animal welfare, and advancing research and development	2bn	0.007bn	2025 - 2030	Grant	Mitigation	1	1	NDC	A training centre for precise livestock feeding. Improved livestock breeds and boost production by reducing herd size. Use biogas digestive as a slow-release organic fertilizer.	
Agriculture	Crop Production	Introduce precision Agro Technology	Set up farmer training centres on precision agriculture and promote technical solutions and machinery with variable rate application, yield monitoring	2000Mn	7Mn	2025 - 2030	Grant / Co-finance	Mitigation	1	1	NDC	Reduced environmental impact, improved efficiency, and enhanced food security. Reduced foreign exchange spent on agricultural imports	

Agriculture	Crop Production	Conduct a comprehensive study on post-harvest losses across the agricultural value chain nationwide.	Minimize the post-harvest losses of agricultural product	29,200 Mn	100Mn	2025 - 2030	Grant	M					Enhance agricultural availability by minimizing post-harvest losses, promoting food security.
Agriculture	Crop Production	Sustainable irrigation system for major and minor irrigation scheme	Improve water use efficiency through alternative wet and dry (AWD) irrigation and enhance major irrigation and cascade systems by rehabilitating tanks and lining water canals.	50,000 Mn	170 Mn	2025 - 2030	Grant/ Co finance	M	1	1	Yes	Mitigation GHG emission due to CH4 and N2O. Enhance water use efficiency through supportive policy, legal and regulatory framework.	
Agriculture	Manure Management	Development of biogas systems	Establish biogas units on livestock farms, with digester capacity based on herd size. Implement large-scale digesters on NLDB farms to generate electricity. Promote proper waste management system	20000 Mn	70Mn	2025 - 2030	Grant	M	1	1	1	Sustainable bioenergy for households and SMEs. Strengthen bioenergy value chains. Boost private sector. Use biogas digesters as organic fertilizer.	

Waste	Collection and Transfer Final Disposal	Improvement of collection and transfer vehicles Closing current dump site at Karadiyana	Improve degradable waste collection and the stability of the dump and minimize the environmental pollution.	300Mn 1,000Mn	1.1Mn 3.5Mn	2022 - 2026	Grant	M	1	1			
Waste	Capacity building	Upgrading of "Mihisaru Field Research and Training Center"	Set up a dedicated centre for capacity building in waste sector.	100Mn	3.5Mn	2023 - 2026	Grant	M	1	1			
Waste	Treatment	Forming Centralized Sewage Treatment Plants for each Province	Improve sewage treatment facilities in each province	360Mn	1.3Mn	2023 - 2026	Grant	Mitigation	1	1			
Waste	Waste Recovery	Construction of MRF	Enhancing non-degradable waste collection through construction of MRF with bailing, sorting table, trolley, hand cart, collection cages, PPE, etc.(Unit cost 25 Mn)	225 Mn	8Mn	2023 - 2026	Grant	Mitigation	1	1			

Waste	Collecti on and Transfe r	Improve waste collection fleet	Purchasing of Machineries for Waste Management - 3m3 Compactors (30 Units) Rs. 240 Mn - Gully Bowsers (10 Units) Rs. 70 Mn - Tractor with trailers (20 Units) Rs. 150Mn - Skid Steer loader (20 Units) Rs. 150 Mn - Bob CAT (10 Units) Rs. 60 Mn - Shredder (10 Units) Rs. 15 Mn	685Mn	2.3Mn	2023 - 2026	Grant	Mitigat ion	1	1			
Waste		Rehabilitatio n/ Safe Closure of existing dumpsites	Rehabilitation/ Safe Closure of existing dumpsites	500 Mn	1.7Mn	2023 - 2026	Grant	Mitigat ion	1	1			
Waste	Waste Recove ry	Improvement of existing waste management centers	Improvement of existing waste management centers	500 Mn	1.7Mn	2023 - 2026	Grant	Mitigat ion	1	1			
Waste	Collecti on and Transfe r	Development of Primary transfer stations	Establishment of transfer stations have been identified to reduce the transportation cost, improve quantity of	400 Mn	1.4 Mn	2022 - 2026	Grant	Mitigat ion	1	1			

			waste transferring per trip and maximizing the resource recovery.										
Waste	Waste Recovery	Development of 10 composting facilities	Expansion of the composting area, leachate treatment and introducing Post aeration system.	150 Mn	5.1 Mn	2022 - 2026	Grant	Mitigation	1	1			
Waste	Waste Recovery	Development of material recovery facilities (MRF)	Establishing new MRFs including three in the Kalutara, Gampaha and Colombo districts and improving existing MRFs.	735 Mn	2.5 Mn	2022 - 2030	Grant	Mitigation	1	1			
Waste	Data management	Development of a comprehensive national Data and Information system	Establish a comprehensive National Data and Information System that integrates a waste exchange platform with localized data management systems to streamline waste tracking, reporting, and material trading across all local authorities.	100 Mn	3.5 Mn	2022 - 2030	Grant	Mitigation	1	1			

Waste	Capacity building and training	Development of capacity building and training programmes for all local authorities including NVQ programmes	Developing short courses, diplomas and NVQ certificate programmes for local authorities workers and supervisors to improve their capacity and knowledge	1,130 Mn	3.9 Mn	2022 - 2030	Grant	Mitigation	1	1			
Waste	Awareness creation	Development of education and awareness creation programmes	Development of island-wide education and awareness creation programmes to promote proper waste handling practices and behavioural change through community engagement and training	200 Mn	6.9 Mn	2022 - 2030	Grant	Mitigation	1	1			
Waste	Wastewater treatment	Establishing new wastewater treatment plans	Jaffna Wastewater Disposal Project	27,617 Mn	9.5 Mn	2025 - 2027	Grant	Mitigation	1	1			
Waste	Wastewater treatment	Establishing new wastewater treatment plans	Negombo Wastewater Disposal Project	31,400 Mn	10.8Mn	2026 - 2030	Grant	Mitigation	1	1			
Waste	Wastewater treatment	Establishing new wastewater treatment plans	Wastewater Management Project for Badulla, Ella Township, Passara,	94,557 Mn	324 Mn	2027 - 2032	Grant	Mitigation	1	1			

			Welimada, Bandarawela, Hambanthota, Dehiwala, Kattankudy, Kalmunai, Maharagama/ Boralessgamuwa, Batticaloa										
Waste	Wastewater treatment	Establishing new wastewater treatment plans	Wastewater Collection and Disposal Projects – Diyawannawa	1,655 Mn	5.7 Mn	2026 - 2027	Grant	Mitigation	1	1			
Waste	Wastewater treatment	Establishing new wastewater treatment plans	Sri Jayawardanapura Kotte Wastewater Management Project	146.5 bn	502 Mn	2026 - 2030	Grant	Mitigation	1	1			
Waste	Wastewater treatment	Upgrading new wastewater treatment plans	Connection Enhancement of Hikkaduwa, Kataragama, Dehiwala/ Mt.Lavinia, Kolonnawa and Kurunegala Sewerage Schemes	11.3 bn	39 Mn	2025 - 2029	Grant	Mitigation	1	1			
Waste	Wastewater treatment	Faecal Sludge Treatment Plants (FSTP)	Hikkaduwa FSTP 100m ³ / day, Galigamuwa FSTP 25m ³ / day, Weligama FSTP 25m ³ / day, Horana FSTP 25m ³ / day, Matara FSTP 25m ³ /	2.8 bn	9.5 Mn	2025 - 2028	Grant	Mitigation	1	1			

			day, Kalutara FSTP 25m ³ /day, Jaffna FSTP 50m ³ /day, Point Pedro FSTP 25m ³ /day, Kelaniya 25m ³ /day FSTP, Mutur 25m ³ /day FSTP, Pahathadumbara 25m ³ /day FSTP, Gampola 25m ³ /day FSTP, Galewela 25m ³ /day FSTP										
Waste	Wastewater treatment	Faecal Sludge Treatment Plants	Nawalapitiya FSTP Rehabilitation	43 Mn	1.5 Mn	2025 - 2026	Grant	Mitigation	1	1			
Tourism		Sustainable destination preparedness & social preparedness	UA	500 Mn	1.71 Mn	UA	Grant Concessional loan Non-concessional	Cross cutting	1	1	1	Sustainable tourism destination development	

Tourism		Emergency response service (Awareness)	UA	30 Mn	0.1 Mn	UA	Grant Concessional loan Non-concessional loan Equity Guarantee Insurance Other (specify)d		1	1	1	Resilience building preparedness	
Tourism		Incorporate early warning systems	UA	20 Mn	0.07 Mn	UA	Grant Concessional loan Non-concessional loan Equity Guarantee Insurance		1	1	1	Strengthen/incorporate early warning system and capacity building in most vulnerable destinations	
Fisheries	Fisheries	Build resilience of vulnerable fisheries communities in Mullaitivu	Developing resilient and adaptive small-scale infrastructure and ecosystems for improvement of livelihoods	584 Mn	2Mn	2025 - 2026	Grant	Adaptation	1	1		Improve socio-economic condition of targeted fishing communities.	
Fisheries	Marine fisheries	Assess climate impacts on fisheries and aquatic resources	Assess the climate impacts on marine fisheries, improve Sensitive habitat management.	4,380 Mn	15Mn	2024 - 2030	Grant	Adaptation	1	1		Increase the number of marine protected areas, mapping of the Sensitive habitats	
Fisheries	Coastal	Strengthening the ocean observation systems and	Increase ocean observation capacity,	4,380 Mn	15Mn	2024 - 2030	Grant	Adaptation	1	1		Forecasting Systems and EWSs	

		development of EWSs	Monitor physio chemical parameters and ocean acidification, Establish automated real time data transmission stations.										
Coastal	Coastal	Prepare sea level rise influenced risk maps, establish Digital Elevation Model (DEM) for the coastal zone and land use maps	Identify vulnerable areas affected by sea level rise and identified potential inundation scenarios	5,840 Mn	20Mn	2024 - 2030	Grant	Adaptation	1	1		Sea Level Rise Risk Maps and Current land use patterns into planning processes.	
Water		Construction of upstream reservoirs for drinking water	Upstream of Yatimahana, Pali Aru and Nawayalawila Reservoirs	137.8 bn	0.47bn	2025 - 2030	Grant	Adaptation	1	1	NDC	To cater the drinking water demand	Value can be changed based on new cost rates
Urban Planning and Human Settlement	Urban Planning	Implement integrated DRR in the Urban Planning	Conduct capacity building programme for LAs to use the gazetted development plans/projects by UDA	11Mn	0.04Mn	2025 - 2026	Grant/ Co-financing	Adaptation	1	1	NDC 1 & 4	Implement Sustainable Environment strategies in DRR plans	

Urban Planning & Human Settlement	Urban Planning	Establish the cloud sourcing platform to monitor and implement the DRR measures	Develop the dashboard to monitor/ implement the gazetted development plans/projects by UDA	2 Mn	6,850	2022 - 2026	Grant	Adaptation	1	1	NDC 1 & 4	Develop the cloud sourcing platform to monitor the plans/projects	
Urban Planning & Human Settlement	Urban Planning	Market the integrated DRR Plans/Projects in the urban planning.	Conduct capacity building programmes for UDA Officials to incorporate investment-oriented plans/projects.	2 Mn	6,850	2025 - 2026	Grant	Adaptation	1	1	1 & 4	Market the Sustainable Development plans/Projects	
Urban Planning & Human Settlement	Urban Planning	Implement integrated DRR in the Urban Planning Sector	Conduct capacity building programme for officials in urban development planning.	3 Mn	10,275	2025 - 2026	Grant	Adaptation	1	1	NDC	Implement Sustainable Environment strategies in DRR plans.	
Urban Planning & Human Settlement	Urban Planning	Preparation of the wetland maps	Prepare the wetland maps to identify the wetland areas to be conserved.	NE	NE	2025 - 2026	Grant	Adaptation	1	1	NDC	Identification of the wetlands which are need to be conserved.	
LULUCF	Forestry	Develop management plans for natural forests	Ensure sustainable forest management	50 Mn	171,235	2025 - 2026	Grant + Co - finance	M / A	1	1	NDC	Sustainable forest health and productivity	
LULUCF	Forestry	Implement forest restoration programmes	18000 ha non forest land will be reforested/ Afforested including Mangroves	18000 Mn	62Mn	2025 - 2030	Grant + Co - finance	M / A	1	1	NDC	Improved biodiversity , soil health, carbon sequestration	

												n and economic benefits	
LULUCF	Forestry	Improve quality of growing stock of natural forests	Improve quality of growing stock of natural forests - 200,000 ha	1000 Mn	3.5Mn	2025 - 2030	Grant + Co - finance	M / A	1	1	NDC	Enhanced carbon sequestration, biodiversity and ecosystem services	
LULUCF	Forestry	Improve quality of forest plantations	Improve quality of forest plantations - 78000 ha	1300Mn	4.4Mn	2025 - 2030	Grant + Co - finance	M / A	1	1	NDC	Enhanced timber quality, production and carbon sequestration	
LULUCF	Forestry	strengthen catchment protection of major rivers and cascade systems	Catchment protection	1000Mn	3.4Mn	2025 - 2030	Grant + Co - finance	M / A	1	1	NDC	Maintain water quality and quantity, reduce erosion.	
LULUCF	Forestry	Improve and increase of Trees Outside Forests	Enhanced the Forest cover and carbon sequestration by planting 2 Mn trees	5000Mn	17Mn	2025 - 2030	Grant + Co - finance	M / A	1	1	NDC	Improved biodiversity, soil fertility and carbon sequestration	
Cross Cutting	Gender	Enhance collection of gender disaggregated data	Develop guidelines and gender related indicators and provide capacity building	100,000 Mn	342.5 Mn	2025 - 2030	Grant	M/A	1		NDC	Enhanced gender and social inclusion in climate actions in all sectors.	

4.3 Financial support received

Financial support has been received through grants, loans and technical assistance, resulting in enhanced renewable energy deployment, energy efficiency improvements and increased agricultural resilience and productivity.

Electricity (Power) sector: Sri Lanka's Electricity (Power) sector transformation has been supported by various international financial sources. The World Bank provided LKR 3,516 million (USD 12 million) for climate finance initiatives focusing on renewables, institutional development and GHG emission reduction. USAID contributed LKR 5,538 million (USD 18.9 million) through the Sri Lanka Energy Program, aimed at creating a market-based, secure. The Asian Development Bank supported the Rooftop Solar Power Generation Line of Credit Project with USD 50 million for rooftop solar installations, including technical support and standards development managed by the Ministry of Finance and the SLSEA. Additional backing came from USAID's AI-Powered Demand Management System project, piloting innovative energy solutions in select households.

Transport sector: Until the end of 2021, several projects received partial support to develop key infrastructure. In public transport, the Asian Development Bank contributed to the Road and Inclusive Connectivity and Development Project (ICDP), which resurfaced 6,300 km of rural roads and supported the 100,000 km by the Local Bank Funded program. Additionally, a pilot project for DC fast-charging stations, initiated by the CPC, advanced electric mobility, showcasing successful public-private sector collaboration to enhance EV infrastructure. These initiatives reflect Sri Lanka's commitment to improving transport and energy infrastructure with international and private sector support.

Industrial sector: The industrial sector has received targeted climate action support through various initiatives. The EU provided EUR 7.7 million for the Accelerating Industries' Climate Response project, which promotes technology adoption and efficiency improvements in the industrial sector, focusing on developing MRV systems for GHG estimation and reduction, along with strengthening policy frameworks. The EU Green Recovery Facility contributed EUR 5 million to establish a platform for policy exchange and technology transfer between European and Sri Lankan companies, supporting a green and blue economy. Additionally, EUR 113,000 from the International Climate Initiative (IKI) aims to reduce energy losses in energy-intensive SMEs in the food sector.

LULUCF sector: Sri Lanka has received substantial financial and technical support for LULUCF-related initiatives from both domestic and international sources. Plans are underway to increase annual budgetary allocations for the forestry sector. Internationally, multilateral climate funds like the Green Climate Fund (GCF) and the Global Environment Facility (GEF) have provided significant funding, including USD 38 million from the GCF to enhance climate resilience and sustainable land use. Additionally, NDA readiness support of USD 781,219 received from GCF through the FAO for the 3rd NDA Readiness Project, Sri Lanka conducted technology needs assessments including LULUCF sector.

Agriculture sector: The agriculture sector in Sri Lanka has received significant international support for climate-resilient development. The World Bank's Agriculture sector Modernization Project contributed LKR 17,000 million (USD 58.63 million), with an additional EUR 23.31

million (USD 28 million) from the European Union, focusing on increasing productivity, improving market access, and supporting agricultural diversification. FAO and USAID provided LKR 2,700 million (USD 9.2 million) to enhance paddy productivity and promote sustainable farming practices. Key projects include the GCF-funded "Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management," promoting water-saving techniques and resilient crops. Other initiatives focus on sustainable farming, institutional strengthening, and climate-smart agriculture.

Fisheries and Livestock sectors: Sri Lanka has received insufficient financial and technical support for climate adaptation in the fisheries and livestock sectors. Key initiatives include the USAID Climate Adaptation Project, which enhances resilience in agriculture, fisheries, and tourism. FAO's Aquatic Health Management Initiative promotes sustainable aquaculture with biosecurity governance, while the ACIAR Aquaculture Productivity Enhancement Project focuses on improving aquaculture efficiency. These projects contribute to capacity building, technology transfer and governance improvements aligned with Sri Lanka's climate adaptation goals.

Water sector: Sri Lanka has received substantial financial support for climate-resilient water management. The Green Climate Fund (GCF) granted USD 39.8 million for the "Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities residing in the vulnerable river basins, watershed areas and downstream of the Knuckles Mountain Range Catchment of Sri Lanka" project (2020-2026) and USD 38.1 million for "Improving Integrated Water Management" (2016-2023). Both projects focus on water security and adaptation in agriculture. The World Bank has contributed USD 42.74 million to the completed "Water Supply and Sanitation Improvement Project" and USD 75.03 million to the ongoing "Sri Lanka Integrated Watershed and Water Resources Management Project." These initiatives aim to enhance water resource management and strengthen resilience against climate change impacts.

Coastal and Marine sectors: As of 2023, Sri Lanka has received financial support for climate adaptation in its coastal and marine sectors, addressing challenges such as rising sea levels, coastal erosion and ecosystem degradation. Key contributors include the Global Environment Facility (GEF), and bilateral aid from Japan and Germany. Funding has been directed towards projects like mangrove restoration, coral reef conservation and strengthening coastal infrastructure to withstand extreme weather events. Additional support has funded early warning systems and climate-resilient aquaculture practices, enhancing resilience for coastal communities and ecosystems.

Tourism sector: The ADB has committed approximately \$100 million through the Sustainable Tourism Sector Development Program, aiming to boost tourism. This program targets infrastructure development in key destinations like Dambulla and Trincomalee. The UNDP's Tourism Roadmap and NSDC scheme support sustainable tourism in Sri Lanka's nine provinces through stakeholder training and conservation initiatives. The World Bank funds climate resilience projects, while Australian Government grants aid SMEs in adapting to challenges like COVID-19 while fostering sustainability.

4.4 Technology development and transfer support needed

Electricity (Power) sector: Technological support is needed for solar PV systems, wind parks, and biomass technologies. Grid infrastructure upgrades, including transmission and distribution network improvements, are essential for integrating renewable energy. Technologies for lighting, appliances and energy-efficient buildings are targeted for implementation for the period of 2025-2030.

Transport Sector: Key technological needs include electric vehicle charging stations, battery-electric buses, and railway electrification technologies. Smart transport systems, such as intelligent traffic solutions and energy-efficient maritime propulsion, are crucial. Technologies for inland transport and container depots are also needed, with implementation for the period of 2025-2035.

Industrial Sector: Technological improvements in biomass energy systems, wastewater treatment, water use efficiency and refrigeration are essential for industrial efficiency.

Waste Sector: Improved waste segregation, modernized collection fleets, and advanced waste treatment facilities are needed. Technologies for composting, material recovery and final disposal systems are required, with integration into a central database for real-time monitoring.

LULUCF Sector: Technologies for geospatial monitoring, reforestation and agro-LULUCF practices are crucial for carbon sequestration and sustainability.

Agricultural Sector: Precision agriculture, biogas digesters and water management technologies are needed to improve productivity and reduce emissions. Implementation is planned for 2025-2030.

Fisheries and Livestock Sector: Resilient aquaculture systems, climate-smart feeding technologies and adaptive infrastructure are needed for climate resilience.

Water Sector: Training in climate resilience and water management, particularly gender-sensitive practices, is essential. Public awareness campaigns will support sustainable water use.

Coastal and Marine Sector: Technologies for marine resilience, including early warning systems and climate-smart aquaculture, are needed to protect coastal ecosystems and livelihoods.

Tourism Sector: Technologies for renewable energy (solar), electric transport, waste management and capacity-building are necessary to ensure sustainable tourism practices. Policy frameworks and financing mechanisms will support the adoption of these technologies.

Health Sector: Technologies for climate-resilient health systems, including early warning, disease surveillance and energy-efficient infrastructure, are needed for climate adaptation. Renewable energy integration in rural health facilities is a priority.

It is expected that most projects will be implemented from 2025 to 2030, with some extending to 2035. Expected impacts include increased renewable energy share, a 15-20% reduction in transport emissions, improved waste management efficiency, and enhanced agricultural productivity with reduced emissions.

Table 4.2 shows the technology development and transfer support needed for the country.

Table 4.2: Information on technology development and transfer support needed

Sector	Sub Sector	Title of activity, programme, project or other	Programme/project description	Type of support	Type of technology	Expected time frame	Expected use, impact and estimated results	Additional information
Energy	Renewable Energy	Renewable energy enhancement	Solar PV (Rooftop, ground-mounted, floating) for grid electricity generation	M	Most Efficient RE	2025-2030	Increased renewable energy share, GHG emission reduction	
Energy	Renewable Energy	Renewable energy enhancement	Large scale onshore wind parks for grid electricity generation	M	Most Efficient RE	2025-2030	Increased renewable energy share, GHG emission reduction	
Energy	Renewable Energy	Renewable energy enhancement	Biomass for thermal energy applications in commercial establishments, institutions, and households	M	Most Efficient RE	2025-2030	Increased renewable energy share, GHG emission reduction	
Energy	Renewable Energy	Renewable energy enhancement	Central biomass terminals for solid biofuel production	M	Most Efficient RE	2025-2030	Increased renewable energy share, GHG emission reduction	
Energy	Renewable Energy	Renewable energy enhancement	Small hydro for grid electricity generation	M	Most Efficient RE	2025-2030	Increased renewable energy share, GHG emission reduction	
Energy	Transmission	Renewable energy enhancement	Transmission and distribution network development to enable integration of renewable energy	M	Most Efficient network with RE	2025-2030	Enhanced transmission & distribution system, GHG emission reduction	
Energy	Transmission	Transmission and distribution network loss reduction	Transmission and distribution network loss reduction	M	Most Efficient network with RE	2025-2030	Reduced T&D loss, GHG emission reduction	
Energy	Energy Efficiency	Improving energy efficiency (EE) and conservation	Efficient lighting & appliances, and other building EE measures	M	Most economical	2025-2030	Reduced energy loss, GHG emission reduction	
Energy	Industry	Enhance biomass fuel use in industries	Improved biomass fuel production (quality assured fuel wood)	M	Most appropriate storage facilities, machineries and technology	2025-2030	Reduced energy loss, GHG emission reduction	

			chips, pellets, briquettes)					
Energy	Industry	Enhance biomass fuel use in industries	O&M and system design improvements in biomass energy conversion systems in industry.	M	Most appropriate storage facilities, machineries and technology	2025-2030	Reduced energy loss, GHG emission reduction	
Industry		Enhance water use efficiency in industries	Water use efficiency improvements in industries Treatment of emerging pollutants	M	High efficient of water recycle facility	2025-2030	Reduce water consumption and GHG emission Reduction	
Transport	Road Transport	EV Charging Infrastructure Expansion	Development of a nationwide network of electric vehicle (EV) charging stations to support the transition to low-emission transport.	M	EV charging infrastructure and grid integration	2024–2030	Increased adoption of EVs, reduction in fossil fuel dependency, and a projected 15% decrease in road transport emissions by 2030.	Aligns with NDCs for low-emission transport.
Transport	Public Transport	Electric Bus Fleet Deployment	Deployment of electric buses in urban public transport networks, including procurement and operationalization of charging infrastructure.	M	Battery-electric bus technology	2024–2032	Reduction in urban GHG emissions, improved air quality, and increased public transport usage, targeting a 20% shift from private vehicles to public transport.	Part of urban mobility enhancement programs in Colombo and Kandy.
Transport	Rail Transport	Railway Electrification Project	Electrification of key suburban and intercity railway lines to replace diesel-powered trains with electric-powered trains, reducing emissions and operational costs.	M	Electrification of railways and supporting grid infrastructure	2025–2035	Significant reductions in GHG emissions from rail transport and improved reliability and efficiency of services, benefiting 5 million annual passengers.	Focuses on Colombo suburban railway corridors.

Transport	Non-Motorized Transport (NMT)	Urban NMT Network Expansion	Development of pedestrian-friendly pathways and dedicated bicycle lanes in high-density urban areas to promote non-motorized mobility options.	M	Urban mobility infrastructure	2023–2028	Increased use of non-motorized transport, improved public health, and reduced urban air pollution, with a projected 10% shift to NMT modes in major cities.	Includes pilot NMT programs in Colombo and Galle.
Transport	Freight Transport	Rail-Based Inland Container Depots Development	Development of rail-based inland container depots to shift freight movement from road to rail, improving fuel efficiency and reducing transport emissions.	M	Freight rail systems	2024–2030	Reduction in freight transport emissions and congestion on highways, targeting a 25% shift of freight volume from road to rail by 2030.	Includes partnerships with private logistics companies.
Transport	Maritime Transport	Energy Efficiency for Vessels	Introduction of energy-efficient propulsion systems for vessels, aligned with MARPOL Annex VI standards, to reduce emissions in the marine sector.	M	Energy-efficient marine technologies	2024–2028	Improved fuel efficiency in maritime transport, contributing to a 10% reduction in GHG emissions from the marine sector by 2030.	Supports compliance with international maritime emission standards.
Transport	Road Transport	Smart Traffic Management Systems	Deployment of intelligent traffic systems, including real-time GPS tracking, demand-responsive signalling, and advanced traffic flow optimization solutions, to reduce congestion and emissions.	M	Intelligent Transport Systems (ITS)	2024–2027	Reduction in vehicle idling times and emissions in urban areas, improved traffic flow, and enhanced commuter experience, with a 15% decrease in congestion-related emissions.	Pilot projects initiated in Colombo metropolitan area.
Transport	Water Transport	Inland Waterway Transport Development	Establishment of canal-based water transport systems using electric or low-emission boats to reduce congestion on roads and promote sustainable alternatives	M	Electric and hybrid watercraft technology	2025–2030	Diversification of urban transport modes, reduced road congestion, and a projected 5% shift of passenger movement to waterways in cities	Includes canal transport feasibility studies for Colombo and Negombo.

			for passenger and freight movement.				with navigable canals.	
Waste	Collection and Transfer	Development of primary transfer stations	Establishment of transfer stations have been identified to reduce the transportation cost, improve quantity of waste transferring per trip and maximizing the resource recovery.	M	Weigh Bridge Systems Digital weighing systems Software for weight recording Data management systems	2022 - 2026	Increasing the amount of recycling waste by 20Mt in Gampaha district.	
Waste	Waste Recovery	Development of 10 composting facilities	Expansion of the composting area, leachate treatment and introducing Post aeration system.	M	Mechanical mixers/turners Material handling equipment Loading/unloading machinery Sorting equipment	2022 - 2026	Increase the compost plant capacity and increase intake waste for degradable waste.	
Waste	Waste Recovery	Development of material recovery facilities (MRF)	Establishing new MRF and improving existing MRFs.	M	Waste Processing Equipment: - Mechanical sorting equipment - Conveyor belt systems - Compactors and balers - Shredders for size reduction - Screening equipment	2022 - 2026	Improve the recovery of materials and reduce residual/burnable waste in the stream.	
Waste	Collection and Transfer	Improvement of collection and transfer vehicles	The degradable waste collection requires compactor vehicles, and the Western Province has an extensive need to improve the number of vehicles.	M	Transportation infrastructure: - Compactor trucks - Transfer vehicles - Collection vehicles. Mobile apps for collection tracking	2022 - 2026	Increase the waste collection amounts.	
Waste	Final Disposal	Closure of current dump site (B) at Karadiyana	Improve the stability of the dump and minimize the environmental pollution	M	Structural stability and slope stabilization equipment, environmental systems for gas extraction, leachate treatment, and air quality monitoring, rehabilitation equipment for capping,	2022 - 2026	Rehabilitate the Site (B) to minimize the environmental and health issues caused by the dump.	

					soil cover, and vegetation, along with monitoring and safety infrastructure such as groundwater wells, data collection systems, and security controls.			
Waste	Capacity building	Development of "MIHISARU Field Research and Training centre"	Set up a dedicated centre for capacity building in waste sector	M	Technical expertise for waste workers and operators	2023 - 2026	Increase the capacity of waste workers both formal and informal	
Waste	Treatment	Construction of Centralized Sewage Treatment Plants for each Province	Improve sewage treatment facilities in each province	M	Technical expertise for waste workers and operators	2023 - 2026		
Waste	Waste Recovery	Construction of MRF	Enhancement of non-degradable waste collection through construction of MRF with bailing, sorting table, Trolley, Hand cart, collection cages, PPE, etc. (Unit cost 25 Mn)	M	Technical expertise for waste workers and operators	2023 - 2026	Improve the recovery of materials and reduce residual/burnable waste in the stream.	
Waste	Collection and Transfer	Improve waste collection fleet	Purchasing of Machineries for Waste Management - 3m3 Compactors (30 Units) Rs. 240 Mn - Gully Bowsers (10 Units) Rs. 70 Mn - Tractor with trailers (20 Units) Rs. 150Mn - Skid Steer loader (20 Units) Rs. 150 Mn - Bob CAT (10 Units) Rs. 60 Mn - Shredder (10 Units) Rs. 15 Mn	M	Technical expertise for waste workers and operators	2023 - 2026	Improve the efficiency of waste collection	

Waste		Rehabilitation/ Safe Closure of existing dumpsites	Rehabilitation/ Safe Closure of existing dumpsites	M	Technical expertise for waste workers and operators	2023 - 2026	Rehabilitate the Site (B) to minimize the environmental and health issues caused by the dump.	
Waste	Waste Recovery	Improvement of existing waste management centers	Improvement of existing waste management centers	M	Technical expertise for waste workers and operators	2023 - 2026	Improve the recovery of materials and reduce residual/burnable waste in the stream.	
Agriculture	Livestock	Livestock & Poultry welfare development	Improve animal housing & environment to provide optimal condition	Cross Cutting	Genetic Improvement Technologies, Methane Reduction Technologies and precision livestock farming	2025-2030	GHG emission reduction	
Agriculture	Livestock	Photovoltaic application in livestock sector operations	PV application for farmer operations processing & value chain involvement	Cross Cutting	Required capital facility and training program	2025-2030	Increased renewable energy & GHG emission reduction	
Agriculture	Livestock	Artificial Intelligence practices in livestock sector monitoring (ICT platform)	Animal identification & data collection system (sensor mechanism) Establish systematic mechanism for data collection through provincial department	Cross Cutting	Capacity building of different stakeholders to access the technology and facilities for implementation	2025-2030	Sustainable management practices help to GHG emission reduction	
Agriculture	Livestock	Technology transfer & capacity building to improve livestock productivity	Modern technology transfer programs for stakeholders	Cross Cutting	Improve the existing training facility and strengthening knowledge of stakeholder	2025-2030	Enhance livestock productivity & GHG emission reduction	
Agriculture	Livestock	Access vulnerable area for the climate change & implement emergency preparedness plan	Minimising the risk for sudden climate change events	A	Advancing climate forecasting system with developing IT Platform among farming community	2025-2030	Sustainable agricultural production system towards GHG emission	
Agriculture	Crop Production	Precision Agriculture	Site specific agricultural Input Management	M	Access to IT (GPS, GIS, RS and sensor technologies, with variable rate application	2025-2030	Minimize fertilizer & agrochemicals. GHG emission through life cycle assessment of those products	

Agriculture	Crop Production	Agriculture Water management	Improve water efficiency in Agriculture Sector	A	Advancing water efficiency technique such as drip irrigation, AWD, etc.	2025-2030	Sustainable water management	
Agriculture	Livestock	Livestock & Poultry welfare development	Improve animal housing & environment to provide optimal condition	M	Genetic Improvement Technologies, Methane Reduction Technologies and precision livestock farming	2025-2030	GHG emission reduction	
Agriculture	Livestock	Photovoltaic application in livestock sector operations	PV application for farmer operations processing & value chain involvement	M	Required capital facility and training program	2025-2030	Increased renewable energy & GHG emission reduction	
Agriculture	Crop Production	Agriculture Water management	Improve water efficiency in Agriculture Sector	M	Drought tolerant crop varieties and Micro irrigation systems	2025-2030	Sustainable water management	
Agriculture	NR	Remote Sensing	Satellite imaging enables real-time monitoring of climate variables, supporting crop health, soil moisture analysis, and weather forecasting for proactive agricultural planning.	A	Remote sensing requires technologies like satellites, drones, and sensors that capture and process data on environmental and land conditions from a distance using electromagnetic radiation.	NR	Expected to yield accurate, real-time data on environmental changes, land use, and resource distribution, enabling improved monitoring, analysis, and decision-making.	
Agriculture	NR	Facilities for Mapping	Deployment of drones and appropriate software for high-resolution mapping of agricultural landscapes. Enables precision mapping of crop fields, identification of vulnerable areas, and rapid assessment of climate impacts like drought and flood.	A	Mapping technologies such as drones and LiDAR use high-resolution imaging, laser scanning, and GPS to create detailed, accurate spatial maps of terrain, vegetation, and infrastructure.	NR	Using drones and LiDAR for mapping is expected to produce highly accurate, detailed 3D models and topographic maps that enhance analysis of terrain features, vegetation, and structural layouts, supporting efficient planning and	

							resource management.	
Agriculture	NR	Water Management for irrigation	Introduction of advanced water conservation systems, including appropriate technologies Development of tools for efficient water use and reduction of wastage, especially in drought-prone areas, to ensure sustainable agricultural productivity.	A	Technologies for irrigation include drip and sprinkler systems, soil moisture sensors, smart controllers, rainwater harvesting, and field-levelling, all aimed at optimizing water use and improving crop yields.	NR	Expected results of using technologies like drip and sprinkler systems, soil moisture sensors, smart controllers, rainwater harvesting, and field-levelling for irrigation include increased water efficiency, reduced wastage, improved crop yields, and enhanced resilience to water scarcity	
Agriculture	NR	Establishment of a Central Research Station for Climate Change Adaptation and Mitigation	Creation of a specialized research facility within the Department of Agriculture focused on climate adaptation and mitigation innovations. Facilitates the development of climate-resilient crop varieties, eco-friendly pest management, and soil conservation practices.	A	Advanced climate modelling tools, data analytics platforms, remote sensing, GIS technology, and field-based monitoring systems to study, predict, and develop solutions for climate impacts	NR	Enhanced understanding of climate impacts, development of effective adaptation and mitigation strategies, and improved resilience of communities and ecosystems to climate change.	
Agriculture	NR	Free Access to Meteorological and Other Data with Data-Sharing Network	Provision of open access to meteorological, soil, and climate-related data to all agricultural stakeholders. Establishes a collaborative data-sharing network among farmers, scientists, and policymakers to enhance decision-	A	A data-sharing network requires cloud platforms, secure systems, APIs for interoperability, and user-friendly interfaces for real-time access.	NR	Improved decision-making for weather-dependent sectors, enhanced disaster preparedness, and greater collaboration among researchers, policymakers, and the public.	

			making and resource management.					
Agriculture	NR	Technical Assistance for Drought and Flood Analysis	Expertise in satellite and drone data enables accurate drought and flood damage assessments, improving resource allocation, response efficiency, and disaster recovery.	A	Satellite imagery, GIS mapping, hydrological modelling software, and real-time data analytics to assess risk, monitor conditions, and predict impacts effectively.	NR	Enhanced capability to assess risk, monitor environmental conditions, and predict potential impacts with high accuracy, enabling timely decision-making and improved resource management.	
Agriculture	Crop Production	Minimizing Post Harvest Loss	Post-Harvest Loss estimation along the value chain for identification of hot spot	M	Efficient storage and product handling	2025-2030	Enhanced crop product availability, GHG emission reduction	
Livestock	All subsectors	Enhancing Water Sustainability through Rainwater Harvesting in Medium- and Large-Scale Farms	Integration of rainwater harvesting systems into medium- and large-scale farms	A	Rainwater harvesting systems	2025-2030	Expected to enhance water availability, reduce dependency on external water sources, and improve livestock productivity and sustainability.	
Livestock	Cattle, Buffalo, Goat, Sheep	Development of High-Yielding and Climate-Resilient Forage and Feed Resources for Livestock Sustainability	Introduce/ develop high yielding and climate adaptable new forage and feed resources	A	Feed quality improvement	2025-2030	To enhance livestock nutrition, increase productivity, and build resilience against climate variability, ensuring sustainable sector growth.	
Livestock	All subsectors	Strengthening Veterinary Surveillance to Address Climate-Related Emerging and Re-Emerging	Improve surveillance by veterinary services to detect and respond to new/re-emerging (Leptospirosis, Tick-borne, etc.) climate related diseases	A	High quality vaccination and selection of resistant breeds	2025-2030	To enhance early disease detection, reduce livestock morbidity and mortality, and safeguard productivity,	

		Livestock Diseases					ensuring the sector's resilience to climate change impacts.	
Livestock	All subsectors	Advancing Research, Education, and Capacity Building for Climate Change Adaptation in the Livestock Sector	Improve research, education, awareness, and capacity building for climate change adaptation in the livestock sector	A	High quality lab facilities and livestock farmer networking	2025-2030	To enhance stakeholder knowledge, promote the adoption of resilient practices, and ensure sustainable productivity in the face of climate challenges	
Livestock	Poultry and swine	Enhancing Climate Resilience in Poultry and Swine Farming Systems	Build resilience in poultry and swine farming against climate change	A	High quality housing facilities and farmer networking Participatory Animal Breeding	2025-2030	To minimize production losses, enhance adaptability to climate stressors, and ensure the sustainability and profitability of these livestock sectors.	
Tourism	Technology development	Renewable energy promotion	Capacity building/motivation/financial support	Cross cutting	Renewable energy technology	UA	Promote sustainable tourism facilities with RE	Solar energy solutions for hotels and eco-lodges.
Tourism		Develop smart transportation	Capacity building/financial support	Cross cutting	Smart transportation technologies	UA	Reduce emissions and improve accessibility is vital. This could include electric vehicles (EVs) for tourist transport and improved public transport options.	
Tourism		Waste management	capacity building /financial support	Cross cutting	Waste Management Technologies	UA	Minimizing the environmental impact of tourism activities. This includes recycling programs and waste-to-energy technologies.	Recycling programs and waste-to-energy technologies.

Tourism		Digital infra-structure development	Capacity building	Cross cutting	Digital infra-structure technologies	UA	Support e-commerce, online bookings, and digital marketing strategies will help local businesses reach a broader audience while promoting responsible tourism practices.	
Water		Advanced water treatment facilities.	To improve water quality – for drinking purposes	A	Advanced filtration and purification systems, including UV treatment, reverse osmosis	2025 - 2030		
Water		Climate-resilient water safety plans (WSPs) for Water Supply Schemes (WSSs),	Technical assistance in water quality testing and monitoring is needed to ensure that climate-induced changes (e.g., increased contamination due to flooding) do not compromise water safety.	A	Technical assistance to implement Climate-resilient water safety plans (WSPs) for Water Supply Schemes (WSSs),	Immediate	To ensure safe, secure drinking water to the consumers	
Water		Real time measurement of water quality and level on major water sources	Establish new technology in real time measurement of water quality and level on major water sources in a collaborative manner with water sector institutions.	A	Installation of advanced sensors for monitoring various water quality parameters (such as pH, turbidity, dissolved oxygen, temperature, and contaminants) and water levels.	2025 - 2030	To improve water quality monitoring systems	
Urban planning and Human settlement		Dashboard and crowdsourcing for monitoring the plan implementation	Use this dashboard to monitor the implementation of projects and regulations proposed in local area development plans	Cross cutting	Digital infrastructure	2025-2028	Improve the plan implementation and monitoring process that will support the monitoring of adaptation efforts in local authority areas and to establish trust and transparency.	Implement as a pilot for 20 local area plans implemented between 2021-2030

Urban planning and Human settlement		Wetland and low lying area mapping	To develop a comprehensive spatial database of wetlands and low lying areas in UDA declared areas will strengthen the environmental and DRR strategies formulated under the local area development plan	Cross cutting	Remote sensing, Satellite imagery or drone mapping	2025-2030	The spatial database can improve the accuracy of planning projects proposed and contribute to reducing the urban floods	Implement as a pilot for 20 local area plans implemented between 2021-2030
LULUCF	Forestry	Geospatial monitoring and remote sensing technologies	For improving first Mgt. practices using satellite and aerial images	Cross cutting	Software and Hardware facilities Remote sensing Technologies	2025-2030	Utilizing for applications on mapping forest cover, assessing biomass, monitoring deforestation and facilitating sustainable forest Mgt.	
LULUCF	Forestry	Sustainable forest Mgt. practices	Balancing ecological health with the economic needs of society	Cross cutting	Social Forestry Analog Forestry	2025-2030	Enhance timber production, while ensuring the preservation of biodiversity, soil health and overall ecosystem stability.	
LULUCF	Forestry	Agroforestry and tree crop integration technologies	Carbon sequestration in agricultural landscape by combining trees with crops and livestock	Cross cutting	Agroforestry and tree crop integration technologies	2025-2030	Efficient use of resources and maximise carbon uptakes. Improve soil Health, biodiversity and mitigate climate change	
LULUCF	Forestry	Efficient afforestation and reforestation techniques	Growing and planting trees for Enhancing survival rates and ecosystem services	Cross cutting	Agroforestry	2025-2030	Increase forest cover, improve biodiversity, and mitigate climate change	

4.5 Technology development and transfer support received

Electricity (Power) sector: Key technological support includes the Renewable Energy Micro-grid Pilot Project, backed by ADB with USD 1.8 million, which led to the establishment of the LECO-UOM Smart Grid Research Laboratory, advancing smart grid technologies for renewable energy integration. Additionally, Sri Lanka's first semi-transparent Solar PV powered Agrivoltaics pilot project was completed in 2023, a collaboration between Hayleys PLC and government agencies, combining agricultural land use with renewable energy generation.

Transport Sector: The Electric Vehicle (EV) Charging Infrastructure project has established 50 public EV stations, promoting electric vehicle adoption. Climate-resilient Road construction in the Central Highlands, supported by JICA and the World Bank, uses advanced materials to withstand flooding, landslides, and high temperatures. The Urban and Regional Public Transport Efficiency Project, with ADB and JICA support, has upgraded public transport with fuel-efficient buses and rail infrastructure. The Landslide Mitigation and Early Warning System Project, backed by the Global Environment Facility, introduced slope stabilization techniques in vulnerable areas.

Agriculture Sector: Technological advancements in crop-animal integrated farming systems have enhanced resilience to climate change, introducing drought- and heat-resistant varieties. The integration of seasonal climate forecasting has improved farmers' preparedness by optimizing planting schedules and resource use. The MOBILISE project, a collaboration between NBRO and the University of Salford, strengthened digital infrastructure for disaster risk reduction.

Water Sector: Sri Lanka has enhanced climate adaptation and mitigation efforts with technology support in water management. Hydro-meteorological stations have been installed for flood risk monitoring, and real-time water quality monitoring has been introduced in the Kelani River. The "Sri Lanka Integrated Watershed and Water Resources Management Project," supported by the World Bank, has adopted watershed management technologies for improved water retention and reduced climate vulnerability. Micro-irrigation systems have been transferred to improve water efficiency and support sustainable agriculture.

- **Disaster Risk Reduction:** Sri Lanka has received significant technological support for disaster risk reduction. The JICA-supported Technical Cooperation Project improved regional mechanisms in the Kelani River Basin. The SATREPS program installed seismometers and rain gauges to monitor seismic activity and landslide risks, enhancing disaster preparedness and response.
- **Urban Development and Building:** The World Bank has supported the establishment of the National Building Code, incorporating resilient building standards. This initiative, in collaboration with CIDA, NBRO, and UDA, focuses on building code conceptualization, approval processes and capacity assessment for building professionals.

- **Research and Development Support:** R&D initiatives have strengthened Sri Lanka’s technological capabilities. The Smart Grid Research Laboratory at the University of Moratuwa has advanced energy technology research. The SATREPS program also developed early warning technologies for landslides, enhancing research in disaster risk reduction.
- **Technical Support (Adaptation Fund Projects):** Three major Adaptation Fund projects have provided technical assistance in critical areas:
 1. Mahaweli River Basin Project – Focused on drought management and landslide risk reduction.
 2. Mullaitivu Project – Developed small-scale infrastructure and ecosystem restoration for fishing and agricultural communities.
 3. ADAPT4R Project – Developed last-mile climate services, including argument and hydromet advisory systems, and climate information services tailored to local needs.

Tourism Sector: Sri Lanka's tourism sector has seen a shift toward technology-driven initiatives. The ICTA's Tech Boost Tourism Project aims to enhance competitiveness and sustainability with digital tools. The World Bank and ADB-supported Mobile Travel Application provides tourists with essential services. Capacity-building programs train operators in sustainable practices and digital marketing, while the Sustainable Tourism Sector Development Program seeks policy reforms for resilience. These initiatives are expected to improve foreign exchange earnings and governance.

4.6 Capacity-building support needed

Overall, it has been noted that capacity building is needed across the sectors to enhance emissions monitoring, data collection, and the use of digital platforms to centralize and analyze emissions-related data. These trainings should be aimed towards enhancing emissions tracking accuracy to support compliance with NIR reporting requirements under the ETF. Additionally, gender-responsive climate action planning must be integrated into capacity building efforts across sectors. Conducting trainings to collect gender disaggregated data, monitoring gender responsive and socially inclusive actions within climate action is required. These initiatives require a coordinated approach to maximize their impact across sectors.

The specific capacity building support needs of a few selected sectors are highlighted below.

Transport Sector: From 2023 to 2030, the transport sector requires capacity building in several areas. Urban transport planners and engineers need training in sustainable mobility planning, electric vehicle adoption, and climate-resilient infrastructure to meet NDC targets for reducing urban transport emissions. Public transport operators and policymakers need workshops from 2024 to 2028 to optimize bus and rail systems, improve energy efficiency and transition to electric buses. Collaboration with international partners will aid the electrification process. Additionally, local authorities need training to develop non-motorized transport infrastructure, promoting safety, accessibility, and reducing emissions.

Industrial Sector: From 2025 to 2027, the industrial sector needs training in MRV systems for tracking NDC progress. Capacity building is also required for implementing co-generation and tri-generation systems to improve energy efficiency. Additionally, training in circular economy principles and industrial symbiosis will help industries adopt more sustainable practices, reduce waste and optimize resource use.

Waste Sector: Requires capacity building from 2022 to 2026. Transfer station operators need training in waste handling, equipment operation, and safety. Technical staff will be trained in modern waste transfer technologies and resource recovery methods. Management-level personnel require training in operations planning and monitoring systems. Digital platform management training will ensure accurate waste flow tracking and emissions reporting. Specialized training for composting and MRF facilities will focus on process optimization, quality control and resource recovery.

Agriculture Sector: Requires capacity building through workshops and Training of Trainers programs for farmers and officers, focusing on sustainable farming practices. These initiatives will promote CSA to improve resilience and productivity. Training on emerging technologies will help farmers adopt innovative solutions, enhancing sustainability and adaptation to climate change.

Water Sector: Requires extensive capacity building to improve water security and treatment. Under NDC 2, training needs include equipment handling, data collection, and community outreach to enhance staff competencies in water security initiatives. Practical training in water quality testing and engaging communities on water conservation practices is crucial. There is also a need for expertise development in gender-sensitive water management approaches, with a focus on gender-responsive policy and project design. With high staff turnover, targeted training for new recruits in climate resilience, water resource management, and hydrological modelling is necessary. Public awareness campaigns, especially school-based programs promoting sustainable water use, should be expanded.

Disaster Risk Reduction and Urban Planning: The UDA needs support in urban planning capabilities, including the establishment of an Urban Research Centre. The National Building Research Organization requires training for the Landslide Vulnerability Mitigation Measures Project, focusing on technical capacity for monitoring and managing high-risk landslides. These programs should include comprehensive training in climate resilience and adaptation strategies to improve disaster risk management.

Tourism Sector: To promote sustainable tourism in Sri Lanka, several key initiatives are underway. Comprehensive training and skills development programs are essential, particularly for local communities, SMEs, and marginalized groups, as seen in the "Skills for Inclusive Growth" program. Raising awareness about responsible tourism practices is crucial for encouraging sustainable behaviours among tourists and operators, with support from educational institutions and NGOs. Infrastructure development for eco-friendly accommodations and waste management systems is also a priority, requiring financial aid and technical expertise. The "Tech Boost Tourism" project focuses on integrating technology to enhance operational efficiency and digital literacy among tourism businesses. Additionally,

effective policy development and governance are necessary to align tourism policies with national climate goals, calling for training for government officials. Engaging local communities in tourism development is vital for preserving cultural heritage and ensuring they benefit from tourism activities through community-based initiatives.

Implementation Timeline and Strategy: The capacity-building needs span from 2022 to 2030, with specific timeframes depending on sector priorities. A coordinated approach is crucial for effective implementation, including regular assessments of training effectiveness, sustainable training mechanisms, and integration with technology transfer programs. Monitoring and evaluation systems must track progress and allow for adjustments as needed. Knowledge-sharing platforms should be established to facilitate learning across sectors and institutions.

The capacity building support needed for the country is shown in Table 4.3.

Table 4.3: Information on capacity building support needed

Sector	Sub Sector	Title of activity, programme, project or other	Programme/project description	Type of support	Expected time frame	Expected use, impact and estimated results	Additional information
Energy		Industrial capacity building on co-generation/try generating systems	Training	Mitigation	2025-2026		
Energy		Concept and industrial symbiosis	Training and awareness	Mitigation	2025-2030	Improved Capacity	
Industry		Industrial capacity building on circular economy	Training	Mitigation	2025-2027		
Transport	Urban Mobility	Capacity Building for Urban Transport Planners	Training programs for urban transport planners and engineers on sustainable mobility planning, electric vehicle (EV) adoption, and climate-resilient infrastructure development.	Adaptation and Mitigation	2023–2030	Increased capacity among urban planners to integrate sustainable transport solutions and resilient infrastructure into urban transport policies.	Supports NDC targets for reducing urban transport emissions and improving resilience in cities prone to flooding and heat stress.
Transport	Public Transport Systems	Technical Training for Public Transport Operators	Capacity-building workshops for operators and policymakers on optimizing bus and rail systems, energy efficiency in fleet operations, and transition to electric buses.	Mitigation	2024–2028	Improved operational efficiency of public transport, reduced energy consumption, and increased capacity to implement electrification projects in public transport.	Collaborative program with international partners experienced in public transport modernization (e.g., Japan and EU).
Transport	Non-Motorized Transport	Promoting Active Transport Knowledge for LAs	Public awareness and capacity-building.	Cross-cutting	2023–2027	reduced emissions and improved public health outcomes in urban areas.	Capacity-building and policies for sustainable city planning framework.

Transport	Road Infrastructure	Climate-Resilient Infrastructure Training	Specialized training for engineers and project managers on designing climate-resilient roads, bridges, and railways, focusing on landslide, flood, and coastal erosion mitigation.	Adaptation	2023–2030	Enhanced technical expertise to develop and maintain resilient transport infrastructure, ensuring year-round connectivity and reducing damage from extreme events.	Includes the establishment of regional training centers for ongoing skill development and collaboration with international engineering organizations.
Transport	Data Management	Development of Transport Emissions Monitoring Systems	Training on emissions monitoring, data collection techniques, and use of digital platforms to centralize and analyse emissions-related data from the transport sector.	Cross-cutting	2024–2029	Improved emissions tracking accuracy, enabling Sri Lanka to meet its GHG reporting requirements under the Enhanced Transparency Framework (ETF).	Part of a larger data integration effort across the Ministry of Transport, Department of Motor Traffic, and the Climate Change Secretariat.
Transport	Freight Systems	Capacity Building for Low-Carbon Freight Systems	Workshops for freight operators and policymakers on transitioning to low-carbon freight solutions, such as rail-based and pipeline systems, and integrating intelligent transport systems (ITS).	Mitigation	2025–2030	Reduction in GHG emissions from freight transport, improved logistics efficiency, and enhanced knowledge of integrating ITS in freight operations.	This initiative aligns with Sri Lanka's NDC focus on transitioning freight to more energy-efficient and sustainable transport modes.
Transport	Inland Water Transport	Development of Skills for Canal-Based Water Transport	Technical training programs for implementing and operating inland waterway passenger and freight services, focusing on electric and low-emission vessels.	Adaptation and Mitigation	2026–2030	Establishment of sustainable water transport systems, reducing road congestion and promoting alternative low-emission transport solutions.	Aligns with plans for inland water transport in Colombo's canal network and other urban centers.

Waste	Collection and Transfer	Development of Primary transfer stations	Establishment of transfer stations have been identified to reduce the transportation cost, improve quantity of waste transferring per trip and maximizing the resource recovery. .	Mitigation	2022 - 2026	Training programs cover efficient waste handling, modern technologies, resource recovery, operations management, emergency response, PPE usage, and compliance with environmental standards.	Increasing the amount of recycling waste by 20Mt in Gampaha district.
Waste	Waste Recovery	Development of 10 composting facilities	Expansion of the composting area, leachate treatment and introducing Post aeration system.	Mitigation	2022 - 2026	Training includes composting processes, leachate treatment, equipment operation, quality control, environmental monitoring, safety, and management skills for operations and compliance.	Increase the compost plant capacity and increase intake waste for degradable waste.
Waste	Waste Recovery	Development of material recovery facilities (MRF)	Establishing new MRFs and improving existing MRFs.	Mitigation	2022 - 2026	Training covers compactor vehicle operation, maintenance, safety, repairs, troubleshooting, route optimization, and fleet management.	Improve the recovery of materials and reduce residual/burnable waste in the stream.
Waste	Collection and Transfer	Improvement of collection and transfer vehicles	The degradable waste collection requires compactor vehicles, and the Western Province has an extensive need to improve the number of vehicles.	Mitigation	2022 - 2026	Training includes dump site closure, environmental monitoring, leachate management, gas control, slope stability, pollution control, and post-closure maintenance.	Increase the waste collection amounts.

Waste	Final Disposal	Closure of current dump site (B) at Karadiyana	Improve the stability of the dump and minimize the environmental pollution	Mitigation		Technical expertise for waste workers and operators	Rehabilitate the Site (B) to minimize the environmental and health issues caused by the dump.
Waste	Capacity building	Development of "MIHISARU Field Research and Training centre"	Set up a dedicated centre for capacity building in waste sector	Mitigation		Technical expertise for waste workers and operators	Increase the capacity of waste workers both formal and informal
Waste	Treatment	Construction of Centralized Sewage Treatment Plants for each Province	Improve sewage treatment facilities in each province	Mitigation		Technical expertise for waste workers and operators	
Waste	Waste Recovery	Construction of MRF	Enhancement of non-degradable waste collection through construction of MRF with bailing, sorting table, Trolley, Hand cart, collection cages, PPE, etc. (Unit cost 25 Mn)	Mitigation		Technical expertise for waste workers and operators	Improve the recovery of materials and reduce residual/burnable waste in the stream.
Waste	Collection and Transfer	Improve waste collection fleet	Purchasing of Machineries for Waste Management - 3m3 Compactors (30 Units) Rs. 240 Mn - Gully Bowsers (10 Units) Rs. 70 Mn - Tractor with trailers (20 Units) Rs. 150Mn - Skid Steer loader (20 Units) Rs. 150 Mn - Bob CAT (10 Units) Rs. 60 Mn - Shredder (10 Units) Rs. 15 Mn	Mitigation		Training includes dump site closure, environmental monitoring, leachate management, gas control, slope stability, pollution control, and post-closure maintenance.	Improve the efficiency of waste collection

Waste		Rehabilitation/ Safe Closure of existing dumpsites	Rehabilitation/ Safe Closure of existing dumpsites	Mitigation		Technical expertise for waste workers and operators	Rehabilitate the Site (B) to minimize the environmental and health issues caused by the dump.
Waste	Waste Recovery	Improvement of existing waste management centers	Improvement of existing waste management centers	Mitigation	2023 - 2026		Improve the recovery of materials and reduce residual/burnable waste in the stream.
Waste	Collection and Transfer	Development of Primary transfer stations	Establishment of transfer stations have been identified to reduce the transportation cost, improve quantity of waste transferring per trip and maximizing the resource recovery. .	Mitigation	2022 - 2026	Training programs cover efficient waste handling, modern technologies, resource recovery, operations management, emergency response, PPE usage, and compliance with environmental standards.	Increasing the amount of recycling waste by 20Mt in Gampaha district.
Tourism	Awareness Raising and Education on tourism	Awareness about responsible tourism practices among stakeholders is crucial for promoting sustainable behaviours.	UA	Adaptation	UA	Promote responsible tourism	
Tourism	Infrastructure Development	develop these infrastructures sustainably	UA	Adaptation	UA	Ensure sustainable tourism practices	
Tourism	Technology Adoption and Digital Literacy	training on digital tools for marketing, booking systems, data analytics, and customer relationship management	Training & facilitation	Adaptation Mitigation Cross-cutting	UA	empower businesses with technology solutions that enhance operational efficiency while promoting environmentally friendly practices	

Tourism	Community Engagement and Empowerment	UA	UA	Adaptation	UA	ensures that they benefit from tourism activities while preserving their cultural heritage.	Capacity-building efforts should focus on empowering communities to develop their own tourism products.
Tourism	Information technology usage	UA	UA	Adaptation	UA	Technology in tourism operations can significantly improve efficiency and sustainability.	Capacity-building programs should include training on digital tools for marketing, booking systems, data analytics, customer relationship management. Initiatives.
Agriculture	NA	Trainings and Workshops for Officers and Farmers	Regular training sessions and workshops are held to equip officers and farmers with knowledge and practical skills in sustainable, climate-adaptive agricultural practices.	Adaptation	NR	To enhance knowledge, build skills in climate-resilient and sustainable practices, improve resource management, and strengthen local capacity for adaptive and productive agriculture.	
Agriculture	NA	Training of Trainers (ToTs) in Collaboration with Foreign Agencies	Specialized Train-the-Trainer (ToT) programs, developed in collaboration with international agencies, equip local trainers with advanced expertise, creating a network of skilled professionals capable of delivering high-quality training to others.	Adaptation	NR	To develop local expertise, facilitate knowledge transfer, and establish a sustainable trainer network to promote best practices and innovations for climate-resilient development.	

Agriculture	NA	Technical Awareness and Knowledge Enhancement on New Technologies	Ongoing efforts aim to enhance stakeholder awareness and adoption of emerging technologies to address climate challenges in agriculture.	Adaptation	NR	To accelerate the adoption of innovative solutions, improve productivity, and foster sustainable practices, enabling stakeholders to better address emerging challenges and opportunities.	
Agriculture	NA	Conduct Training Workshops on Modern Climate-Smart Agriculture (CSA) Practices	Targeted workshops on CSA practices provide participants with actionable knowledge to boost resilience, productivity, and environmental sustainability.	Adaptation	NR	Expected to equip farmers with the knowledge and skills to enhance productivity, build resilience to climate change, and promote sustainable farming techniques.	
Water		Capacity building for equipment handling	Ensure water security at all times with the required quality and quantity, the staff of NWSDB require training on how to handle equipment for several field tests.	Adaptation	2025 - 2030	To establishing wellhead protection	
		Capacity building for how to corporate Gender aspect	Build awareness and capacities of the main planning and implementation agencies in the Water sector on gender issues related to climate change and access	Adaptation	Immediate	Address gender aspect in Water NDC	
LULUCF	Forestry	Develop Forest Management Plan for Natural Forests	To ensure sustainable Management	Mitigation	2025-2026	Promote sustainable forest health and productivity by balancing economic	

						growth with legal frameworks.	
LULUCF	Forestry	Implement Forest restoration programmes	18000 ha non forest land will be reforested/Afforested including Mangroves	Mitigation	2025-2030	Can enhance biodiversity, improve soil health, increase carbon sequestration and provide economic benefits-	
LULUCF	Forestry	Improve quality of forest plantations	Improve quality of forest plantations (78000 ha) in Sri Lanka	Mitigation	2025-2026	Enhance Timber quality and production and carbon sequestration	
LULUCF	Forestry	Strengthen catchment protection	Catchment protection of major rivers and cascade systems of Sri Lanka	Adaptation and Mitigation	2025-2030	Maintain water quality and quantity, reduce erosion and sedimentation, preserve biodiversity, support sustainable agriculture	
LULUCF	Forestry	Improve and increase Trees Outside Forests (TROF)	Enhance the Forest cover and carbon sequestration by planting 2 million trees	Mitigation	2025-2030	Enhance biodiversity, provide additional timber production and income, improve soil fertility, contribute carbon sequestration	
LULUCF	Forestry	Geospatial monitoring and remote sensing technologies	For improving forest management practices using satellite and aerial images	Mitigation	2025-2030	Utilizing for applications on mapping forest cover, assessing biomass, monitoring deforestation & facilitating sustainable forest management	
LULUCF	Forestry	Sustainable forest management practices	Balancing ecological health with the economic needs of society	Adaptation and Mitigation	2025-2030	Enhance timber production, ensuring the preservation of biodiversity, soil health and overall ecosystem stability	

LULUCF	Forestry	Agroforestry and tree crop integration technologies	Carbon sequestration in agricultural landscape by combining trees with crops and livestock	Adaptation and Mitigation	2025-2030	Efficient use of resources and maximize carbon uptake. Improve soil health, biodiversity and mitigate climate change	
LULUCF	Forestry	Efficient afforestation and reforestation techniques	Growing and planting trees for enhancing survival rates and ecosystem services	Adaptation and Mitigation	2025-2030	Increase forest cover, improve biodiversity, and mitigate climate change	
LULUCF	Forestry	Improve quality of growing stock of natural forests	Improve quality of growing stock of natural forests (200,000 ha) in Sri Lanka	Mitigation	2025-2030	To enhance carbon sequestration and increase biodiversity and ecosystem services	
Crosscutting	All Sectors	Enhance collection of gender disaggregated data	Develop guidelines, gender related indicators for NDC Implementation Plan for NDC sectors and provide capacity building to enhance gender and social inclusion aspects related to climate action tracking	Cross-cutting	2025-2027	Technical expertise	

4.7 Capacity-building support received

Electricity (Power) sector: The Electricity (Power) sector has received targeted capacity-building support to advance renewable energy integration and innovative technologies, particularly through USAID initiatives. Notable programs include the Renewable Energy Integration and Procurement workshop, which trained over 50 government officials on renewable energy systems and procurement. The South Asia Energy Master Class on Green Hydrogen involved 66 participants from six countries, fostering cross-border cooperation and knowledge sharing on emerging energy technologies. These programs successfully combined technical training with policy development, providing a comprehensive approach to capacity building in the Electricity (Power) sector.

Transport Sector: In the transport sector, significant capacity-building efforts have enhanced climate resilience and infrastructure development. The Climate-Resilient Engineering Training Programme trained 200 engineers in designing infrastructure resilient to climate impacts. The Electric Vehicle Infrastructure Development Programme equipped 50 technicians and engineers with specialized knowledge in EV charging infrastructure installation and maintenance. Complementary programs on data management and emissions monitoring, supported by UNDP, addressed emissions across transportation modes. Multi-stakeholder engagement, including government, private sector, and local technical professionals, has been essential in strengthening disaster response capabilities and local government adaptation policy development.

Industry Sector: The industry sector has received extensive support for energy efficiency and emissions reduction. The Energy Management System (EnMS) Expert Training Programme, implemented by UNIDO, trained 140 industry representatives, significantly improving energy management. The Energy System Optimization Programme provided 50 participants with expertise in optimizing systems such as steam, motors, and pumps. The sector also benefited from training in GHG accounting and verification, with 30 participants gaining crucial knowledge. These efforts, in collaboration with international organizations, have built a strong foundation for sustainable industrial development and emissions reduction.

LULUCF Sector: The Capacity-building Initiative for Transparency (CBIT) project by the FAO in Sri Lanka aims to enhance the country's ability to meet its NDCs under the Paris Agreement, focusing on the Agriculture, Forestry, and Other Land Use (AFOLU) sector, with a total funding of USD 863,242 allocated from March 2021 to December 2024. A key component of this initiative is the Enhanced Transparency Framework (ETF) which supports improved measurement, reporting, and verification systems for climate actions. Additionally, the FAO is implementing two other readiness projects: the Second Readiness Project which focuses on enhancing the capacity of the National Designated Authority and relevant stakeholders to assess climate finance priorities for agriculture, and the Third Readiness Project aimed at strengthening stakeholder engagement in climate adaptation planning. Both projects are funded by the Green Climate Fund (GCF). The Global Green Growth Institute (GGGI) is also involved with a project titled "Strengthen the Process and Capacity of Implementation of National Adaptation Plan of Sri Lanka," which focuses on building resilience in vulnerable

sectors through enhanced adaptation planning. Furthermore, in 2024, the GCF launched a project in the Knuckles Mountain Range, concentrating on ecosystem resilience and sustainable land management practices.

Tourism Sector: The Tech Boost Tourism Project, launched by ICTA in 2022, aims to enhance technological capabilities in Sri Lanka's tourism sector. This initiative supports businesses in improving operational efficiency and sustainability through infrastructure improvements, data management, and community engagement. Additionally, the Skills for Inclusive Growth Program focuses on vocational training for marginalized groups to create tourism-related job opportunities. Digital marketing initiatives, including a mobile app and social media campaigns, help adapt to post-COVID-19 consumer behaviours. Community-based tourism is being promoted through training in hospitality and sustainable practices, while the government works on policy development to establish effective governance structures for sustainable tourism practices.

4.8 Information on support needed and received for transparency-related activities, including for transparency-related capacity-building

Across all sectors, there is a need for technical support to develop integrated data management systems and enhance existing NIR systems. This includes the operationalization of digital platforms for transparency reporting, capacity-building programmes for technical staff on MRV methodologies, and the enhancement of institutional capacity for data management. Infrastructure upgrades are also required, such as automated data collection systems and integrated reporting platforms. The requirements of some sectors are highlighted below.

Electricity (Power) sector: Requires significant support to further enhance data management to track energy-related emissions. This includes enhancing MRV capabilities to track renewable energy projects, drawing on the National Energy Balance system and strengthen institutional capacity for energy data collection and reporting. Furthermore, automated monitoring systems are needed to ensure the accurate and timely reporting of energy efficiency programs, enabling better tracking of energy-related climate actions. Gender and social inclusion related indicators are required to ascertain impacts in promoting just transition pathways.

Transport Sector: To enhance transparency, the transport sector requires an estimated USD 8 million in support across several initiatives. Key needs include a centralized Transport Emissions Monitoring System, estimated at USD 2 million, to enable systematic monitoring, reporting and verification (MRV) of transport emissions. Digital platforms and software development, requiring USD 3 million, are needed for real-time emissions data collection. Capacity building programs, totalling USD 1 million, will focus on GHG inventory preparation and data analysis techniques. Additionally, enhancing existing reporting systems (USD 1.5 million) will ensure compliance with ETF requirements, while public awareness campaigns (USD 500,000) will help promote emissions transparency and reporting.

Industry Sector: Requires support for implementing transparency mechanisms to track industrial emissions and NDC implementation. Transparent monitoring systems for co-

generation and energy optimization projects are also needed to track industrial emissions more effectively. Gender and social inclusion related indicators are required to ascertain impacts in promoting just transition pathways.

Agriculture Sector: Establishing regionally relevant indicators to monitor and evaluate adaptation measures is essential for enhancing transparency. These indicators should be integrated into national and local MRV systems, supported by technologies like remote sensing and GIS. Clear guidelines are required for monitoring sustainable land management, water conservation and climate-resilient crops, along with systems for regular reporting to meet the Paris Agreement requirements. Additionally, gender-responsive metrics are necessary to ensure inclusivity in adaptation efforts, particularly for vulnerable groups. Strengthening institutional capacity to access climate finance and transparently use funds for adaptation projects is also a priority.

Water Sector: To develop monitoring and evaluation systems for river basin assessments and enhance data collection mechanisms for water security initiatives. Transparent monitoring systems are required for water quality and accessibility, along with capacity-building for managing water-related climate data to ensure comprehensive reporting of adaptation measures.

Tourism Sector: Requires technical assistance and funding to establish robust monitoring and reporting systems that align with international GHG reporting standards. This includes accurate data collection and capacity-building initiatives to train personnel in effective reporting methodologies. A stakeholder engagement framework is essential to improve transparency in decision-making, involving local communities, government agencies, and the private sector. Adoption of advanced tools like GIS and remote sensing is encouraged for better monitoring, while policy development support is necessary to ensure alignment with international transparency standards under Article 13 of the Paris Agreement. These initiatives aim to promote sustainable tourism practices that address climate change challenges. Table 4.4 shows the information on support needed and received by developing country parties.

The information on support needed and received for transparency-related activities, including transparency-related capacity-building is shown in Table 4.4.

Table 4.4: Information on support needed and received for transparency-related activities, including transparency-related capacity-building

Title of activity, programme, project or other	Objectives and description	Expected time frame	Recipient entity	Channel	Amount		Status of activity	Expected use, impact and estimated results	Additional information
					Domestic currency LKR	USD			
Capacity Building for Transparency Reporting	Develop a centralized system for MRV for transport emissions, including integration with national databases, compliance with Article 13 requirements.	2025–2030	MOT, CCS	Bilateral/Multilateral	586 Mn	2,000,000	Planned	Enhanced accuracy in emissions reporting, alignment with ETF standards, and improved tracking of mitigation progress in the transport sector.	Collaboration with international partners for technical support.
Capacity Building for Transparency Reporting	Conduct training programs for transport sector institutions on GHG inventory preparation, data collection, and analysis techniques specific to Article 13 reporting requirements.	2025–2028	MOT, DMT	Bilateral/Multilateral	293 Mn	1,000,000	Planned	Improved institutional capacity for data management and reporting, contributing to accurate and timely reporting of transport-related emissions.	Includes workshops and online training sessions in collaboration with international agencies.
Development of Digital Tools for Emissions Data	Create digital platforms and software for real-time emissions data collection, integrating Vehicle Emission Testing (VET) results and fuel consumption data from Ceylon Petroleum Corporation.	2025–2027	MOT, CCS	Bilateral/Private sector	879 Mn	3,000,000	Planned	Streamlined emissions data collection and enhanced transparency, enabling Sri Lanka to meet its reporting obligations under Article 13 while improving emissions	Platform will be shared with stakeholders, including CPC and DMT, to ensure seamless data integration and access.

								estimation accuracy.	
Public Awareness Campaigns on Transport Emissions Transparency	Raise public awareness of the importance of transport emissions reporting, its role in climate action, and how individuals and institutions can contribute to reducing emissions.	2025–2026	MoE, NGOs	Multilateral	146.5 Mn	500,000	Planned	Increased public engagement in emissions reduction efforts, fostering community-level accountability and contributions to climate goals.	Campaign materials will be developed in local languages for broader reach.
Upgrading Existing Reporting Systems	Enhance existing transport sector reporting systems to meet the ETF requirements, ensuring compatibility with IPCC guidelines and Article 13 reporting.	2025–2029	CCS	Bilateral/Multilateral	439.5 Mn	1,500,000	Planned	Strengthened transparency and compliance with international climate reporting standards, improving the credibility and accuracy of national reports.	Collaboration with the Ministry of Finance for resource allocation

CHAPTER 5

Areas to be improved and other relevant information including gender

Chapter 5

Areas to be improved and other relevant information including gender

5.0 Overview

Sri Lanka has made significant progress in developing policies, strategies, action plans and programs for climate mitigation and adaptation. However, challenges remain in ensuring effective coordination and monitoring implementation of climate actions. Wider stakeholder capacity building and human resources development across agencies are essential to streamline these processes and improve overall effectiveness. In addition, strengthening data and information management systems is vital to facilitate the UNFCCC reporting requirement timely and accurately.

This chapter highlights critical gaps, areas to be improved and actionable recommendations including on the MRV system to enhance climate change reporting.

5.1 NIR Preparation

The following recommendations were flagged to enhance NIR preparation.

a) Smooth functioning of a robust data collection system

While there are different levels of MRV systems in place/being established sector-wise, it is required to operationalize these MRV frameworks with clear guidelines and protocols. This also requires focal points to be designated to continuously update and maintain data and information including activity level data and emission factors. Further, it is required to enhance capacity of the relevant stakeholders including private sector to ensure smooth functioning of the MRV systems. This will also require providing regular hands-on trainings on reporting against the standardized data formats and web-based MRV data portals.

Existing databases and tools such as Sri Lanka Energy Balance by Sustainable Energy Authority, Vehicle Emission Test Trust Fund's database and Statistic Digest by the Ceylon Electricity Board could be strengthened to enhance data collection for the respective MRV system.

b) Legal mechanism/regulation pertaining to data collection

It was noted that a legal framework should be established to optimize the functioning of a real-time cross-sectoral data sharing network. This could be supplemented through Memoranda of Understanding (MoUs) and data sharing agreements among the key data providers and reporting entities.

c) Strengthening institutional and technical capacity

During the NIR preparation it was indicated that primary data was not available for certain data sources and proxy data for these source points were also not available. For instance, it was suggested that due to the absence of real time fuel consumption data per vehicle type, the mileage of each vehicle could be used to calculate fuel consumption.

It was also observed that the mechanism for archiving inventory data, including activity data and emission factors used for inventory development, requires improvement.

d) Improving data availability

Some of the activity data is not available to measure the emissions of key sources across sectors. For example, only plastic waste burning is quantified due to data constraints. It is recommended to adopt/procure tools and build capacity of the relevant stakeholders to fill these data gaps. It is required to further strengthen the existing mechanism to measure sequestration capacity, aligning with internationally acceptable guidelines.

e) Enhancing quality assurance and quality control systems

It is suggested to develop user-friendly protocols and guidelines to enhance the quality of data collection, measurement and reporting. Developing dedicated human and physical resources (including ICT equipment/infrastructure) within key agencies is crucial for ensuring the efficient collection, verification, and management of quality data. Capacity-building efforts should focus on training personnel in technical skills for data collection and analysis, upgrading technological infrastructure to enhance data management systems and strengthening institutional frameworks to improve coordination and implementation of climate actions.

5.2 Tracking progress of NDCs implementation

Several gaps have been identified to track progress made in implementing and achieving NDCs.

a) Lack of continuous awareness programmes on NDCs

Noting the unavailability of dedicated financial resources, it was revealed that there is minimal awareness on NDCs amongst the general public. Therefore, it is recommended to have continuous awareness programmes for the general public including key stakeholders to enhance commitment to implement NDCs at the grassroots level.

b) Insufficient monitoring and evaluation of NDC implementation

There is inadequate national-level monitoring and evaluation of the progress and achievement of NDC implementation which hinders the ability to accurately track and evaluate outcomes. Further to this it is required to develop a comprehensive M&R system for adaptation sectors. Additionally, it is required to strengthen the MRV for NIR to report on mitigation related NDCs. To enable smooth monitoring it is suggested to develop measurable indicators for mitigation, adaptation and L&D sectors in the NDC 3.0 update.

c) Lack of sector-wise priority and climate hazard maps

It is required to update priority and climate hazard maps to assess vulnerabilities, target and plan NDC implementation across sectors. Further, having such maps will be the baseline for tracking progress of NDC implementation.

d) Insufficient research on climate change impacts

It is needed to facilitate comprehensive national-level research to assess the impacts of climate change on economy, ecosystem and society. Use the findings to develop targeted strategies that enhance the adaptive capacities of vulnerable sectors and communities, ensuring long-term climate resilience. This should include looking at climate-gender impacts (including collecting gender disaggregated data) in the transition to carbon net zero pathways and resilience building.

e) Limited integration of NDCs into annual sectoral plans

NDC implementation activities are not consistently integrated into the regular functions of responsible agencies. To further mainstream NDCs into sectoral development plans, an operational arm should be established in each respective NDC sector. During the NDC 3.0 update, it is suggested to develop a mechanism to integrate NDCs into sectoral action plans and programmes. Further, NDCs should be integrated into national development strategies to promote alignment with broader development goals.

f) Limited inter-agency coordination and communication

To further strengthen the coordination and communication between the CCS and NDC focal points, it is suggested to re-visit the existing mechanism and identify potential improvements.

g) Capacity and resource constraints

A shortage of technical, institutional capacity and resources, hampers the effective implementation of NDCs. Resources need to be mobilized to strengthen technical and institutional capacity to further enhance implementation and tracking of NDCs progress. This includes providing trainings, resources and institutional support to enhance the effectiveness of NDC implementation and monitoring.

h) Alignment of NDCs with NIR activities

During the NDC 3.0 update, it is suggested to improve alignment between NDCs and NIR activities. For example, only one NDC action is directly linked to GHG sources in the IPPU sector. Specifically, it is recommended to incorporate energy saving related NDCs in the IPPU sector into the Electricity (Power) sector and update sectoral targets during NDC 3.0.

5.3 Climate change impacts and adaptation

The effectiveness of adaptation policies, strategies, and plans depends on adequate funding, technical expertise, and the engagement of local communities

5.4 Support needed and received

A comprehensive assessment on the financial, technological and capacity building support needed should be regularly conducted.

A centralized mechanism is required to identify the financial, technology transfer and capacity building needs, monitor progress, and track the support received, aligning with CTFs and ETF tool. This gap has made it challenging to compile and report accurate information on the support required and received.

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Annexes

Chapter 1

Annex 1: GHG emissions summary: Energy sector

Categories	GHG Emissions (Gg)		
	Net CO ₂	CH ₄	N ₂ O
Total National Emissions and Removals	20,684.02	28.15	0.85
1 - Energy	20,684.02	28.15	0.85
1.A - Fuel Combustion Activities	20,684.02	28.15	0.85
1.A.1 - Energy Industries	7905.57	0.46	0.15
1.A.2 - Manufacturing Industries and Construction	1164.03	2.68	0.36
1.A.3 - Transport	9,925.21	2.29	0
1.A.4 - Other Sectors	1689.21	24.93	

Annex 2: The GWP values for 100-year time horizon for GHG

GHG	GWP values for 100-year time horizon (CO ₂ -eq)
CO ₂	1
CH ₄	28
N ₂ O	265

Annex 3: Sectoral Sources of Activity Data

Sector	Sources of Activity Data
Energy	National Energy Balance reports 2011 - 2021 published by SLSEA (energy.gov.lk/images/energy-balance/energy-balance-2021.pdf)
IPPU	Directly from relevant factories (cement, ceramic, glass), GSMB, Fertilizer Secretariat, Department of Census and Statistics, Excise Department Annual Reports, SLSEA
Agriculture, Forest and Land Use Change (AFOLU)	Department of Census & Statistics, Department of Animal Production & Health, Central Bank Reports, MoA, Department of Agriculture, National Institute of Post-Harvest Management, SLSEA, Department of Irrigation, Department of Forest Conservation, State Timber Corporation, Ministry of Plantation and Community Infrastructure
Waste	<i>Primary data:</i> Ministry of Environment, Central Environmental Authority, National Solid Waste Management Support Centre, Western Province Waste Management Authority, National Water Supply and Drainage Board, Board of Investments of Sri Lanka (BOI), SLLDC <i>Secondary data from reports:</i> National Program for the Solid Waste Management (2020), National Plastic Action Plan (2021), National Plastic Waste Inventory for Sri Lanka (2024), Western Province Solid Waste Management Master Plan (2023), UNDP Rapid Assessment on Health Care Waste management in Sri Lanka (2021)

Transport	Fuel Consumption Data: National Energy Balance reports 2011- 2021 (energy.gov.lk/images/energy-balance/energy-balance-2021.pdf) Vehicle Data from 2011-2021: Annual reports from National Transport Commission, Reports from DMT, Vehicle Kilometer data from an ongoing study by the University of Moratuwa in collaboration with the DMT.
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Annex 4: Key Category Analysis of GHG emissions by sector/ subsector (Level and Trend Assessment)

Categories	GHG emission (Gg CO ₂ -eq)	Cumulative emission	Cumulative Percentage
1.A.3 - Transport	9,928.01	9,928.01	34.3%
1.A.1 - Energy Industries	7,958.27	17,886.28	61.8%
1.A.4 - Other Sectors	2,476.46	20,362.74	70.4%
3C7 - Rice Cultivation Irrigation/Rainfed)	2,160.25	22,523.00	77.8%
3A 1- Enteric Fermentation	1,957.15	24,480.15	84.6%
3C4& 3C5 - Agricultural Soil (D/I emission from managed soil)	1,523.94	26,004.09	89.8%
1.A.2 - Manufacturing Industries and Construction	1,334.15	27,338.24	94.5%
4A Waste Disposal	473.70	27,811.94	96.1%
2A1 - Cement Production	370.64	28,182.58	97.4%
3A2 Manure Management	209.73	28,392.31	98.1%
3C3 Urea Application	158.26	28,550.57	98.6%
2A2 - Lime Production	125.23	28,675.80	99.1%
4C Incineration and Open Burning	108.00	28,783.80	99.4%
3C1b Field Burning (CH ₄ & N ₂ O)	57.15	28,840.95	99.6%
4B Biological Treatment	45.80	28,886.75	99.8%
4D Wastewater Treatment	30.40	28,917.15	99.9%
2A3 - Glass Production	15.45	28,932.60	100.0%
2A4 - Ceramic Production	7.97	28,940.57	100.0%
3C2 liming by Dolomite	3.62	28,944.19	100.0%

Annex 5: Activity Data Identified in the Energy sector

GHG Source and Sink Categories	Reported Activity Data
Total Energy	
1.A. Fuel combustion activities (sectoral approach)	
1.A.1. Energy industries	
1.A.1.a. Public electricity and heat production	Electricity Generation (1.A.1.a.i) Thermal power plant fuel consumption
1.A.1.b. Petroleum refining	Crude oil balance
1.A.2. Manufacturing industries and construction	
1.A.2.g. Other	Reported under other category due to sector segregated information not available

1.A.3. Transport	GHG emissions arise from petrol and diesel combustion. Emission calculations utilize annual fuel sales data from the CPC and vehicle data from the DMT and NTC, along with revenue license renewals for estimating the active vehicle fleet (DMT, 2021). These calculations rely on IPCC Tier 1 default emission factors.
1.A.3.a. Domestic aviation	Jet A1 and Aviation Gasoline consumption for energy balance
1.A.3.b. Road transportation	Total LPG, Motor gasoline and diesel consumption were assigned to motor cars and heavy-duty vehicles & buses
1.A.3.c. Railways	Total diesel consumption used for railway department
1.A.4. Other sectors	
1.A.4.b. Residential	Household & commercial fuel consumption were recorded under same category, no segregated data
1.A.4.c. Agriculture/LULUCF/fishing	Agriculture sector fuel consumption records collected for the energy balance from plantation companies.
1.D. Memo items	
1.D.3. CO₂ emissions from biomass	Biomass consumption

Emissions from waste to energy processes being addressed in the Energy sector. Energy balance reports waste to energy resources consumption under the biomass category.

Annex 6: Fuel Types recorded in National Energy Balance against the respective and relevant fuel types selected in inventory calculation categories of the IPCC

	Fuel Type in the Energy Balance	IPCC Fuel Category
1	LPG	LPG
2	Gasoline	Motor Gasoline
3	Naptha	Naptha
4	Av. Gas	Aviation Gasoline
5	Kerosene	Other Kerosene
6	Jet A1	Jet Kerosene
7	Diesel	Gas/Diesel Oil
8	Fuel Oil (FO 1500)	Residual Fuel Oil
9	Residual Oil	Residual Fuel Oil
10	Solvents	N/A
11	Coal	Sub-Bituminous Coal
12	Bagasse Agro Residues	Other Primary Solid Biomass
13	Firewood	Wood / Wood Waste
14	Charcoal	N/A
15	Crude Oil	Crude Oil

Annex 7: Main GHG Contributor in the Energy sector

Year	CO ₂	CH ₄	N ₂ O	Total (CO ₂ -eq)	CO ₂ (%)
2011	16,174.84	1,280.01	344.92	17,804.39	91%
2012	17,518.52	1,300.72	360.22	19,179.46	91%
2013	14,150.08	1,213.71	343.44	15,707.22	90%
2014	17,257.70	1,218.02	360.96	18,836.68	92%
2015	17,818.20	1,167.78	368.37	19,354.35	92%
2016	20,430.31	902.35	346.31	21,678.97	94%
2017	22,852.54	1,096.28	393.55	24,342.37	94%
2018	21,457.71	837.38	361.67	22,656.76	95%
2019	21,937.86	844.39	352.18	23,134.44	95%
2020	20,418.60	843.25	336.43	21,598.28	95%
2021	20,684.02	788.15	224.67	21,696.90	94%

Annex 8: Trends in GHG emissions in Sri Lanka's Transport sector

GHGs		CO ₂	CH ₄	N ₂ O	Total
GHG emission (Mt CO ₂ -eq)	2011	7534.04	1.33	0.4	7535.77
	2012	7356.7	1.36	0.4	7358.46
	2013	7690.75	1.43	0.42	7692.6
	2014	7986.11	1.51	0.44	7988.06
	2015	9141.02	1.79	0.5	9143.31
	2016	10898.35	2.49	0.58	10901.42
	2017	9554.37	2.17	0.51	9557.05
	2018	9729.88	2.29	0.51	9732.68
	2019	9953.46	2.38	0.53	9956.37
	2020	8615.98	2.08	0.45	8618.51
	2021	9925.21	2.29	0.51	9928.01

Annex 9: Emissions of CO₂ from cement production (2011 – 2021)

Year	Clinker Production (tonne)	CO ₂ (Gg)
2011	648,008	336.96
2012	706,061	367.15
2013	698,120	363.02
2014	716,294	372.47
2015	707,957	368.14
2016	726,600	377.83
2017	706,167	367.21
2018	703,386	365.76

2019	713,222	370.88
2020	698,626	363.29
2021	712,763	370.64

Source: INSEE Cement, 2022 (what is the report name of INSEE)

Annex 10: CO₂ emissions in Lime production

Year	Limestone Production Tonne			Dolomite tonne (Estimated)	Emission CO ₂ (Gg)
	Limestone	Seashell	Total		
2011	275474	0	275474	146914	191.29
2012	317500	2742	320242	103424	190.24
2013	359372	2890	362262	118119	215.74
2014	250799	5262	256061	60644	141.59
2015	204419	3189	207608	37504	109.24
2016	307982	13294	321275	29554	155.46
2017	189201	19982	209183	25653	104.28
2018	99096	2487	101582	90860	88.04
2019	52653	1978	54631	30209	38.45
2020	174705	4685	179390	52497	103.97
2021	219290	5803	225093	54897	125.23

Source: GMSB (Limestone data); Fertilizer Secretariat (Dolomite), Directly from Industries (Ceramic, Glass, Cement Factories)

Annex 11: Consumption and CO₂ Emissions of Key Materials in Glass Industry

Year	Consumption (tonne)			Emissions CO ₂ (Gg)			
	Dolomite	Soda Ash	Calcite	Dolomite	Soda Ash	Calcite	Total
2010	9334.81	9334.81	4613.03	4.45	3.87	2.03	10.36
2011	8430.50	8430.50	5017.26	4.02	3.50	2.21	9.73
2012	8380.84	8380.84	4935.97	4.00	3.48	2.17	9.65
2013	7907.94	7907.94	4450.03	3.77	3.28	1.96	9.01
2014	8515.83	8515.83	4554.77	4.06	3.53	2.00	9.60
2015	8726.14	8726.14	5452.41	4.16	3.62	2.40	10.18
2016	9635.77	9635.77	6460.59	4.60	4.00	2.84	11.44
2017	8868.64	11424.68	6128.92	4.23	3.68	2.70	10.61
2018	8546.20	11301.20	5786.40	4.08	4.69	2.55	11.31
2019	8978.80	13701.30	7155.40	4.28	5.69	3.15	13.12
2020	8336.40	13638.90	7185.70	3.98	5.66	3.16	12.80
2021	9549.30	16725.50	8992.80	4.56	6.94	3.96	15.45

Data Source: PGP Glass PLC, Sri Lanka

Annex 12: CO₂ emissions of calcite and dolomite combustion in Ceramic Industries

Year	Calcite Consumption (tonne)	Dolomite Consumption (tonne)	Emission CO ₂ (Gg)
2011	3,904.18	7,926.07	5.50
2012	3,919.27	8,116.51	5.60
2013	4,134.09	6,537.46	4.94
2014	8,720.48	8,072.94	7.69
2015	8,109.51	8,742.70	7.74
2016	8,575.55	7,835.88	7.51
2017	8,139.12	8,248.82	7.52
2018	7,424.98	8,551.73	7.35
2019	6,958.17	8,829.47	7.27
2020	6,357.64	8,065.60	6.64
2021	6,583.23	10,639.79	7.97

Source: Royal Ceramics Lanka PLC; Lanka Tiles PLC; Lanka Walltiles PLC; Noritake Lanka Porcelain Pvt Ltd.; Novel Ceramics Pvt Ltd; Royal Furnwood Porcelain Pvt Ltd; Art Décor International; Hega Tile Pvt Ltd; Ceramic World Pvt Ltd; Macksons Tiles Lanka Ltd.; Dankotuwa Porcelain PLC; RSL Pvt Ltd; Midaya Ceramic Company Pvt Ltd.; Ceramic Association

Annex 13: Emissions of NMVOC from solvent applications

Year	Solvent (Tonne)	Emission Factor - Gg	NMVOC Gg
2011	3,801	1	3.8
2012	3,700	1	3.7
2013	2,995	1	3.0
2014	2,514	1	2.5
2015	1,514	1	1.5
2016	634	1	0.6
2017	619	1	0.6
2018	1,560	1	1.6
2019	1,660	1	1.7
2020	897	1	0.9
2021	3,037	1	3.0

Source: CORINAIR B621, SLSEA

Annex 14: Production of bread and its NMVOC emissions

Year	No. of Households	Bread (tonne)	NMVOC emission (Gg)
2011	5,091,315	219,944.8	0.99
2012	5,236,533	226,218.2	1.02
2013	5,269,675	227,650.0	1.02
2014	5,354,329	231,307.0	1.04
2015	5,424,627	234,343.9	1.05
2016	5,455,835	235,692.1	1.06
2017	5,613,777	242,515.2	1.09
2018	5,673,394	245,090.6	1.1

2019	5,770,391	249,280.9	1.12
2020	5,869,209	253,549.8	1.14
2021	5,984,781	258,542.5	1.16

Source: Department of Census and Statistic

Annex 15: Production of Spirits and Emission of NMVOCs

Year	Spirit - Liters				NMVOC Gg
	Coconut	Palmyra	Sugarcane	Total	
2011	2,616,467.125	93,315.370	7,321,793.500	10,031,576.00	1.50
2012	3,382,709.600	43,323.500	2,797,301.300	6,223,334.40	0.93
2013	3,465,721.900	42,119.120	7,085,117.900	10,592,958.92	1.59
2014	4,030,228.000	17,237.700	8,910,840.100	12,958,305.80	1.94
2015	5,407,624.918	15,821.725	6,612,539.646	12,035,986.29	1.81
2016	5,085,503.900	29,102.500	12,022,872.200	17,137,478.60	2.57
2017	2,931,526.500	35,249.346	7,055,928.000	10,022,703.85	1.50
2018	2,301,080.500	51,560.750	9,406,050.000	11,758,691.25	1.76
2019	2,712,270.400	4,879.700	9,742,081.700	12,459,231.80	1.87
2020	2,205,047.718	10,140.568	12,342,454.600	14,557,642.89	2.18
2021	2,387,553.400	11,018.800	15,765,613.400	18,164,185.60	2.72

Source: Excise Department

Annex 16: Consolidated Inventory - IPPU Sector (2021)

Code	GHG Category	Annual Emission Gg	
		CO ₂	NMVOC
2	IPPU Sector	519.29	6.93
2A	Mineral Industry	519.29	
2A1	Cement Production	370.64	
2A2	Lime Production	125.23	
2A3	Glass Production	15.45	
2A4	Ceramic Production	7.97	
2D	Other Production		
2D1	Solvent		3.04
2H	Other		
2H2	Food and Beverage		3.88

Annex 17: GHG emissions/removals in the LULUCF sector

Sub Sector	Year	Biomass Gains	Biomass Losses	Net Biomass Change	DOM Change	Soil Carbon Change	CH ₄ emissions	Net CO ₂ flux
Forest	2011	-2674.85	278.67	-2396.18	-23.63	-59.07	NA	-2478.88
	2012	-2630.59	347.17	-2283.42	-11.27	-28.15	NA	-2322.8
	2013	-2776.3	235.85	-2540.45	-24.48	-61.19	NA	-2626.12
	2014	-2800.58	347.14	-2453.44	-33.04	-82.59	NA	-2569.07
	2015	-2802.75	290.85	-2511.9	-44.41	-111.02	NA	-2667.33
	2016	-2853.65	500.37	-2353.28	-34.54	-86.35	NA	-2474.17
	2017	-2855.38	248.69	-2606.69	-9.48	-23.7	NA	-2639.87
	2018	-2787.26	295.79	-2491.47	-4.41	-11.02	NA	-2506.9
	2019	-2213.41	273.94	-1939.47	-2	-5	NA	-1946.47
	2020	-2746.93	285.87	-2461.06	-5.52	-13.8	NA	-2480.38
	2021	-2809.37	247.31	-2562.06	-48.31	-120.78	NA	-2731.15
Cropland	2011	-5116.54	212.47	-4904.07	-97.15	-93.48	NA	-5488.9
	2012	-5185.91	253.17	-4932.74	-193.59	-194.68	NA	-5505.8
	2013	-5223.58	302.22	-4921.36	-199.96	-201.29	NA	-5550.8
	2014	-5691.41	279.89	-5411.52	-172.94	-172.87	NA	-5601.13
	2015	-5763.98	223.52	-5540.46	-84.66	-80.1	NA	-5710.59
	2016	-5892.56	177.19	-5715.37	-58.83	-52.89	NA	-5710.59
	2017	-5983.66	154.01	-5829.65	-93.63	-89.32	NA	-6003.39
	2018	-5978.52	167.89	-5810.63	-70.67	-65.12	NA	-5904.19
	2019	-6075.04	119.72	-5955.32	-56.72	50.35	NA	-6135.07
	2020	-6164.44	120.1	-6044.34	-54.66	-48.07	NA	-611.44
	2021	-6210.18	135.72	-6074.46	-55.99	-49.38	NA	-6424.42
Grassland	2011	-15.14	0.18	-14.96	-0.76	0	NA	-15.72
	2012	-14.96	0.18	-14.78	-0.75	0	NA	-15.53
	2013	-14.78	0.18	-14.6	-0.74	0	NA	-15.34
	2014	-14.6	0.18	-14.42	-0.73	0	NA	-15.15
	2015	-14.42	0.18	-14.24	-0.72	0	NA	-14.96
	2016	-14.24	0.18	-14.06	-0.72	0	NA	-14.78
	2017	-14.06	0.18	-13.88	-0.71	0	NA	-14.59
	2018	-13.88	0.18	-13.88	-0.7	0	NA	-14.4
	2019	-13.7	0.18	-13.52	-0.69	0	NA	-14.21
	2020	-13.52	0.18	-13.34	-0.68	0	NA	-14.02
	2021	-13.34	0.18	-13.16	0.67	0	NA	-13.83
Wetlands	2011	-243.23	0	-243.23	NA	-242.54	40.25	-445.52
	2012	-261.63	0	-261.98	NA	-249.55	39.5	-471.68
	2013	-280.03	0.18	-14.6	-0.74	0	NA	-15.34
	2014	-298.43	0	-298.43	NA	-265.35	38.6	-525.18
	2015	-306.91	0	-306.9	NA	-268.35	38.25	-537.06
	2016	-306.02	0	-306.02	NA	-267.35	38.05	-535.32
	2017	-305.13	0	-305.13	NA	-266.61	37.95	-533.79
	2018	-304.24	0	-304.24	NA	-265.88	37.86	-532.26
	2019	-303.35	0	-303.35	NA	-265.11	37.75	-530.71
	2020	-303.07	0	-303.07	NA	-264.52	37.6	-529.99
	2021	-302.89	0	-302.89	NA	-263.98	37.45	-529.42
Settlements	2011	-28.8	0	-28.8	NA	NA	NA	-28.8
	2012	-28.98	0	-28.98	NA	NA	NA	-28.98

	2013	-29.16	0	-29.16	NA	NA	NA	-29.16
	2014	-29.25	0	-29.25	NA	NA	NA	-29.25
	2015	-29.34	0	-29.34	NA	NA	NA	-29.34
	2016	-29.43	0	-29.43	NA	NA	NA	-29.43
	2017	-29.52	0	-29.52	NA	NA	NA	-29.52
	2018	-29.61	0	-29.61	NA	NA	NA	-29.61
	2019	-29.7	0	-29.7	NA	NA	NA	-29.7
	2020	-29.7	0	-29.7	NA	NA	NA	-29.7
	2021	-29.75	0	-29.75	NA	NA	NA	-29.75

Note: Under the sub category of forests only forest plantations were considered as per the IPCC2006/2019 refinement.

Croplands included Coconut, Rubber, Tea, Oil Palm and Home gardens.

Wetlands included marsh, swamps, villus and mangroves.

Under Settlements only the tree cover in the settlements were considered.

Annex 18: Key Category Analysis

The Key Category Analysis is conducted to identify and prioritize the most significant GHG emission sources and sinks based on their contribution to total national emissions. The analysis is based on the IPCC Category codes and is focused on emissions data from 2021.

A	B	C	D	F	G
IPCC Category code	IPCC Category	GHG	2021 Ex,t (Gg CO ₂ -eq)	Lx,t	Cumulative Total of Column F
1.A.3.b	Road Transportation - Liquid Fuels	CO ₂	9,863.405	0.499	50%
1.A.1	Energy Industries - Solid Fuels	CO ₂	5,833.433	0.295	79%
1.A.1	Energy Industries - Liquid Fuels	CO ₂	2,072.139	0.105	90%
1.A.2	Manufacturing Industries and Construction - Liquid Fuels	CO ₂	960.948	0.049	95%
1.A.4	Other Sectors - Liquid Fuels	CO ₂	261.590	0.013	96%
1.A.2	Manufacturing Industries and Construction - Solid Fuels	CO ₂	203.079	0.010	97%
1.A.3.b	Road Transportation - Liquid Fuels	N ₂ O	130.242	0.007	98%
1.A.2	Manufacturing Industries and Construction - Biomass - solid	N ₂ O	92.619	0.005	98%
1.A.3.a	Civil Aviation - Liquid Fuels	CO ₂	82.356	0.004	99%
1.A.2	Manufacturing Industries and Construction - Biomass - solid	CH ₄	73.396	0.004	99%
1.A.3.b	Road Transportation - Liquid Fuels	CH ₄	65.311	0.003	99%
1.A.3.c	Railways - Liquid Fuels	CO ₂	62.978	0.003	100%
1.A.1	Energy Industries - Solid Fuels	N ₂ O	24.129	0.001	100%
1.A.3.c	Railways - Liquid Fuels	N ₂ O	6.441	0.000	100%
1.A.1	Energy Industries - Liquid Fuels	N ₂ O	4.319	0.000	100%
1.A.1	Energy Industries - Biomass - solid	N ₂ O	2.703	0.000	100%
1.A.1	Energy Industries - Liquid Fuels	CH ₄	2.282	0.000	100%
1.A.1	Energy Industries - Biomass - solid	CH ₄	2.142	0.000	100%
1.A.2	Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	1.724	0.000	100%
1.A.1	Energy Industries - Solid Fuels	CH ₄	1.700	0.000	100%
1.A.4	Other Sectors - Liquid Fuels	CH ₄	1.024	0.000	100%
1.A.2	Manufacturing Industries and Construction - Liquid Fuels	CH ₄	0.950	0.000	100%
1.A.2	Manufacturing Industries and Construction - Solid Fuels	N ₂ O	0.840	0.000	100%
1.A.3.a	Civil Aviation - Liquid Fuels	N ₂ O	0.611	0.000	100%
1.A.2	Manufacturing Industries and Construction - Solid Fuels	CH ₄	0.592	0.000	100%
1.A.4	Other Sectors - Liquid Fuels	N ₂ O	0.582	0.000	100%
1.A.3.c	Railways - Liquid Fuels	CH ₄	0.099	0.000	100%
1.A.3.a	Civil Aviation - Liquid Fuels	CH ₄	0.016	0.000	100%

Annex 19: Uncertainty Analysis

Uncertainty Analysis is conducted to assess the level of uncertainty associated with GHG emission estimates. Potential sources of uncertainty in the data, methods, and assumptions used in the emission calculations are identified and quantified. Statistical methods, such as Monte Carlo simulations, are typically used to evaluate the impact of uncertainty on the overall emission estimates. The reliability of the emission data is better understood, and the results are used to inform decision-making processes related to climate policies and emission reduction strategies.

2006 IPCC Categories	Gas	Base Year emissions or removals (Gg CO ₂ -eq)	Year T emissions or removals (Gg CO ₂ equivalent)	Activity Data Uncertainty (%)	Emission Factor Uncertainty (%)	Combined Uncertainty (%)	Contribution to Variance by Category in Year T	Type A Sensitivity (%)	Type B Sensitivity (%)	Uncertainty in trend in national emissions introduced by emission factor uncertainty (%)	Uncertainty in trend in national emissions introduced by activity data uncertainty (%)	Uncertainty introduced into the trend in total national emissions (%)
1.A.1.a.i - Electricity Generation - Solid Fuels	CO ₂	1001.27	5833.43	5.00	12.46	13.43	16.39	0.29	0.36	3.56	2.54	19.15
1.A.3.b.iii - Heavy-duty trucks and buses - Liquid Fuels	CO ₂	5037.55	5582.31	5.00	3.42	6.06	3.05	0.03	0.34	0.09	2.43	5.93
1.A.3.b.i.1 - Passenger cars with 3-way catalysts - Liquid Fuels	CO ₂	2243.70	4281.10	5.00	3.07	5.87	1.69	0.10	0.26	0.30	1.87	3.57
1.A.1.a.i - Electricity Generation - Liquid Fuels	CO ₂	4452.46	1897.46	5.00	6.14	7.92	0.60	0.21	0.12	1.29	0.83	2.34
1.A.2.m - Non-specified Industry - Liquid Fuels	CO ₂	785.96	960.95	5.00	6.14	7.92	0.15	0.00	0.06	0.01	0.42	0.18
1.A.2.m - Non-specified Industry - Solid Fuels	CO ₂	202.07	203.08	5.00	12.46	13.43	0.02	0.00	0.01	0.03	0.09	0.01
1.A.4.c.i - Stationary - Liquid Fuels	CO ₂	13.45	261.59	5.00	6.14	7.92	0.01	0.02	0.02	0.09	0.11	0.02
1.A.1.b - Petroleum Refining - Liquid Fuels	CO ₂	1029.54	174.67	5.00	6.14	7.92	0.01	0.06	0.01	0.40	0.08	0.16
1.A.2.m - Non-specified Industry - Biomass - solid	CH ₄	1.99	2.62	5.00	222.22	222.28	0.00	0.00	0.00	0.00	0.00	0.00

1.A.3.a.ii - Domestic Aviation - Liquid Fuels	CO ₂	22.68	82.36	5.00	4.21	6.54	0.00	0.00	0.01	0.01	0.04	0.00
1.A.3.b.i.1 - Passenger cars with 3-way catalysts - Liquid Fuels	CH ₄	1.07	2.04	5.00	244.69	244.74	0.00	0.00	0.00	0.01	0.00	0.00
1.A.3.c - Railways - Liquid Fuels	CO ₂	83.33	62.98	5.00	2.02	5.39	0.00	0.00	0.00	0.00	0.03	0.00
1.A.2.m - Non-specified Industry - Biomass - solid	N ₂ O	0.27	0.35	5.00	275.00	275.05	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.b.iii - Heavy-duty trucks and buses - Liquid Fuels	CH ₄	0.27	0.29	5.00	244.69	244.74	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.b.iii - Heavy-duty trucks and buses - Liquid Fuels	N ₂ O	0.27	0.29	5.00	209.94	210.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.b.i.1 - Passenger cars with 3-way catalysts - Liquid Fuels	N ₂ O	0.10	0.20	5.00	209.94	210.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Solid Fuels	N ₂ O	0.02	0.09	5.00	222.22	222.28	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Liquid Fuels	CH ₄	0.18	0.07	5.00	228.79	228.84	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Biomass - solid	CH ₄	0.00	0.08	5.00	222.22	222.28	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Solid Fuels	CH ₄	0.01	0.06	5.00	200.00	200.06	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.m - Non-specified Industry - Liquid Fuels	CH ₄	0.03	0.03	5.00	228.79	228.84	0.00	0.00	0.00	0.00	0.00	0.00
1.A.4.c.i - Stationary - Liquid Fuels	CH ₄	0.00	0.04	5.00	200.00	200.06	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.c - Railways - Liquid Fuels	N ₂ O	0.03	0.02	5.00	200.00	200.06	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.m - Non-specified Industry - Solid Fuels	CH ₄	0.02	0.02	5.00	200.00	200.06	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Liquid Fuels	N ₂ O	0.04	0.01	5.00	228.79	228.84	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Biomass - solid	N ₂ O	0.00	0.01	5.00	275.00	275.05	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.b - Petroleum Refining - Liquid Fuels	CH ₄	0.04	0.01	5.00	228.79	228.84	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.m - Non-specified Industry - Liquid Fuels	N ₂ O	0.01	0.01	5.00	228.79	228.84	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.m - Non-specified Industry - Solid Fuels	N ₂ O	0.00	0.00	5.00	222.22	222.28	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.c - Railways - Liquid Fuels	CH ₄	0.00	0.00	5.00	150.60	150.69	0.00	0.00	0.00	0.00	0.00	0.00

1.A.4.c.i - Stationary - Liquid Fuels	N ₂ O	0.00	0.00	5.00	236.36	236.42	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.a.ii - Domestic Aviation - Liquid Fuels	N ₂ O	0.00	0.00	5.00	150.00	150.08	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.b - Petroleum Refining - Liquid Fuels	N ₂ O	0.01	0.00	5.00	228.79	228.84	0.00	0.00	0.00	0.00	0.00	0.00
1.A.3.a.ii - Domestic Aviation - Liquid Fuels	CH ₄	0.00	0.00	5.00	100.00	100.12	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.a.i - Electricity Generation - Biomass - solid	CO ₂	0.00	0.00	5.00	17.57	18.27	0.00	0.00	0.00	0.00	0.00	0.00
1.A.4.b - Residential - Liquid Fuels	CO ₂	1302.82	0.00	5.00	6.14	7.92	0.00	0.10	0.00	0.59	0.00	0.34
1.A.4.b - Residential - Liquid Fuels	CH ₄	0.15	0.00	5.00	200.00	200.06	0.00	0.00	0.00	0.00	0.00	0.00
1.A.4.b - Residential - Liquid Fuels	N ₂ O	0.01	0.00	5.00	236.36	236.42	0.00	0.00	0.00	0.00	0.00	0.00
1.A.4.b - Residential - Biomass - solid	CO ₂	0.00	0.00	5.00	17.57	18.27	0.00	0.00	0.00	0.00	0.00	0.00
1.A.4.b - Residential - Biomass - solid	CH ₄	41.96	0.00	5.00	200.00	200.06	0.00	0.00	0.00	0.62	0.00	0.38
1.A.4.b - Residential - Biomass - solid	N ₂ O	0.56	0.00	5.00	250.00	250.05	0.00	0.00	0.00	0.01	0.00	0.00
1.A.1.c.i - Manufacture of Solid Fuels	CO ₂	0.00	0.00	5.00	5.00	7.07	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.c.i - Manufacture of Solid Fuels	CH ₄	0.00	0.00	5.00	5.00	7.07	0.00	0.00	0.00	0.00	0.00	0.00
1.A.1.c.i - Manufacture of Solid Fuels	N ₂ O	0.00	0.00	5.00	5.00	7.07	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.m - Non-specified Industry - Biomass - solid	CO ₂	0.00	0.00	5.00	17.57	18.27	0.00	0.00	0.00	0.00	0.00	0.00

Annex 20: Quality Assurance/Quality Control Plan and related arrangements for BTR1 in Sri Lanka

a) Background

Under the Enhanced Transparency Framework, Parties to the Paris Agreement are required to submit their **Biennial Transparency Reports (BTR)** every two years. BTR reports track GHG emissions, mitigation actions, financial/ technical/ capacity support, and other relevant data. To maintain the reliability of the reports, a robust QA/QC plan is essential. This Quality Assurance/Quality Control (QA/QC) Plan is designed to ensure that the Biennial Transparency Reports (BTR) prepared by Sri Lanka adhere to the highest standards of accuracy, consistency, and reliability. The QA/QC procedures will ensure data integrity, correctness, and enhance the credibility of the reports

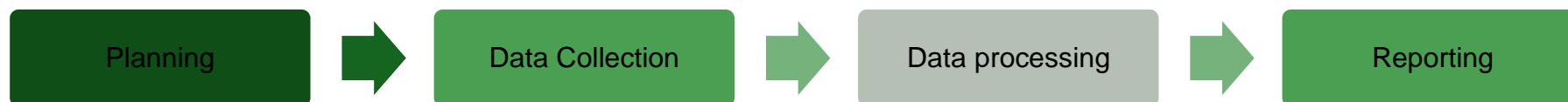
Key objectives of this QA/QC plan are including but, not limited to,

1. Ensuring the correctness, consistency, completeness, comparability, and transparency of the data.
2. Standardizing processes for data collection, processing, reporting, and documentation.
3. Identify, correct, and prevent errors in data and methodologies used in the BTR.
4. Ensuring that the BTR preparation aligns with international reporting standards and UNFCCC guidelines.

Quality assurance mechanisms include sector-specific reviews and regular meetings with SCCs, RCCs, and the National Working Group. An annual review evaluates the progress of climate actions, with findings submitted to the National Steering Committee (NSC) and the National Expert Committee on Climate Change Adaptation (NECCCA).

QA/QC Stages

Key project stages applicable for quality assurance & quality check,



b) Key stakeholders and responsibilities for BTR

Key Stakeholder	Responsibility	Role & Project Stage
Ministry of Environment, Sri Lanka	Overall coordination of the BTR preparation and final approval of the report	QC - Reporting
CCS	Focal point for BTR preparation, coordinating the technical and administrative tasks.	QC - Planning Data processing Reporting
Technical Expert Team (NCPC-SL)	Responsible for data collection, validation, and report drafting for various sectors NIR/ Mitigation NDCs/ Article 9-11: energy, industry, waste, agriculture, LULUCF, and land-use changes Adaptation NDCs/ Article 9-11: Agriculture, health, fisheries & livestock, water, biodiversity, coastal & marine, urban planning, human settlement	QA - Planning Data collection Data processing Reporting
Internal QA/QC Team (NCPC-SL)	Performs detailed checks at each stage of data collection, analysis, and reporting	QC - Planning Data collection Data processing Reporting
Third-party Reviewers (SLCF)	Provide external review and validation of data and methodologies used	QC -Data processing Reporting
Data Providers (Sector Stakeholders)	Entities such as government ministries, private sector actors, and research institutions that supply the data required for the report	QA - Data collection

c) QA/QC Procedures

QA/QC procedures from the IPCC Guidelines which are being closely followed, are summarized as follows.

1. Data Collection and Processing

- **Source Data Verification:** Ensure all data comes from credible, verified sources like government statistics, international databases, or peer-reviewed studies.
- **Cross-Checking:** Cross-check data between different sectors or reports (e.g., compare energy data with economic activity reports).
- **Use of IPCC Guidelines:** Ensure that GHG inventory preparation follows the IPCC-2006

- Gap Analysis: Conduct regular gap analysis to identify any missing data or methodological inconsistencies.
- Monitor trends and re-check estimates if significant changes or departures occur, explaining any differences.
- Handling of Assumptions and Proxies: Document assumptions and proxies used in sectors where data is incomplete and clearly explain the rationale behind these choices.

2. Reporting

- Consistency and Comparability Checks: Check for consistency with previous reports, ensuring that methodologies, emissions factors, and data sources are comparable across different BTR cycles.
- Uncertainty Analysis: Conduct uncertainty assessments for emissions data, clearly documenting the uncertainty ranges and reasons.
- Peer Review Process: Have technical experts from sectors not directly involved in the report preparation review the BTR for clarity, consistency, and accuracy.
- Transparency: Ensure that all calculations, assumptions, and methodologies are transparent and documented in the report.

3. General

- Documentation and Version Control: Ensure all documents, methodologies, datasets, and assumptions used are properly archived.
- Maintain version control logs for changes in methodologies, emissions factors, and assumptions.
- Personnel Training: Provide training on IPCC guidelines, UNFCCC reporting standards, and data handling best practices to all staff involved in BTR preparation.
- Sector-Specific QA/QC Protocols: Establish clear sector-wise protocols for energy, agriculture, LULUCF, waste, and other sectors to ensure data consistency.

4. Documentation and Record-Keeping: All documentation related to the QA/QC process, including data sources, methodologies, error logs, and review reports, will be archived and stored securely. These records shall be made accessible for future reference and audits.

d) Comparison of Internal QC Procedures and External QA Processes in BTR Review and Validation

	Internal Quality Control Procedures (QC)	External Quality Assurance Process (QA)
	Review process	Validation
	<ul style="list-style-type: none"> ● First Level Review: Conducted by data providers who review data for completeness and plausibility before submission to the technical expert teams. ● Second Level Review: Conducted by the expert team, who collect and process data. ● Second Level Review: Conducted by the internal QA/QC team, who reviews the methodologies and consistency with international guidelines. 	<ul style="list-style-type: none"> ● Engage external experts to review the entire BTR to ensure compliance with international standards. ● Ensure that third-party reviewers have access to all necessary data, methodologies and documentation for an in-depth review. ● Final Review: Conducted by the CCS and external consultants before submission to the MoE for approval.
	Tracking & Correction	Response/ accept corrections
	<ul style="list-style-type: none"> ● Implement an error log system where any discrepancies or errors found during reviews are documented and corrected. ● Ensure that all errors are resolved before final report submission. 	<ul style="list-style-type: none"> ● Develop a response plan for addressing comments and feedback from external reviewers. ● Ensure that the final report reflects any necessary corrections or improvements based on this feedback.

e) Quality Assurance Checklist: Data Handling, Documentation, and Emission Calculation Processes in GHG Inventory Preparation

ID	Item	Quality Inspection						Supporting documents
		Date	Individual (Initials-Org)	Result (Pass/ Partial/ Fail)	Date	Individual (Initials-Org)	Corrective action	
1. Data Gathering, Input and Handling Activities								
1.1	Ensure that all data used comes from credible and verified sources such as government statistics, international databases, or peer-reviewed studies	14-Oct	RW-NCPC	Pass	NA	NA	NA	National Energy Balance (Excel file)
1.2	Check a sample of input data for transcription errors	14-Oct	RW-NCPC	2017 and 2018 activity data were identical	18-Oct	RW-NCPC	Checked and corrected using the source file	
1.3	Review spreadsheets with computerized checks and/or quality check reports	14-Oct	RW-NCPC	Fuel consumption data recorded in '000 ToE for some years	28-Oct	RW-NCPC	Converted to TJ values using conversion factor of 41.87	D/:NCPC> UNDP_BT R>NIR
2. Data Documentation								
2.1	Check project file for completeness	14-Oct	RW-NCPC	2016 Data were missing			Checked and corrected using the source file	
2.2	Check that assumptions and criteria for selection of activity data, emission factors and other estimation parameters are documented							
2.3	Check that changes in data or methodology are documented	14-Oct	RW-NCPC	Pass	NA	NA	NA	
2.4	Cross-check data between different sectors or reports	30-Oct	RW-NCPC	Pass	NA	NA	NA	

3. Calculating Emissions and Checking Calculations								
3.1	Ensure that GHG inventory preparation follows the IPCC-2006	4-Nov	RW-NCPC	Pass	NA	NA	NA	
3.2	Check that all calculations are included	4-Nov	RW-NCPC	Pass	NA	NA	NA	
3.3	Check whether units, parameters, and conversion factors are presented appropriately	4-Nov	RW-NCPC	Pass	NA	NA	NA	
3.4	Check if units are properly labelled and correctly carried through from beginning to end of calculation	4-Nov	RW-NCPC	Pass	NA	NA	NA	
3.5	Check that conversion factors are correct	4-Nov	RW-NCPC	Pass	NA	NA	NA	
3.6	Monitor the trend and if there are significant changes or departures from expected trends, re-check estimates and explain any differences.	6-Nov	RW-NCPC	Pass	NA	NA	NA	
3.7	Check a representative sample of calculations, by hand or electronically	6-Nov	RW-NCPC	Pass	NA	NA	NA	
3.8	Check the aggregation of data within a category	6-Nov	RW-NCPC	Pass	NA	NA	NA	
3.9	Check current year estimates against previous years (if available) and investigate unexplained departures from trend	6-Nov	RW-NCPC	<i>Deviation from trend can be observed in 2022 when the country affected by pandemic</i>	NA	NA	NA	
3.10	Check for any unexplained or unusual trends for activity data or other calculation parameters in time series	6-Nov	RW-NCPC	<i>Deviation from trend can be observed in 2022 when the country affected by pandemic</i>	NA	NA	NA	
3.11	Check for consistency with IPCC inventory guidelines and good practices, particularly if changes occur	9-Nov	RW-NCPC		NA	NA	NA	

Chapter 2

Annex 21: Structured summary of tracking progress made in implementing and achieving the NDCs - Electricity (Power) including Transport, IPPU, Waste and Forestry sectors

Energy	Unit, as applicable	Reference point(s), level(s), baseline(s), base year(s) or starting point(s){MPGs, p. 67, 77(a)(i)}	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii–iii)}				Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)
		2021 (BAU)	2021	Year 2	Year 3	End Year			
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreement: {MPGs, p. 65, 77(a)}									
Electricity (Power) sector GHG emission	Gg	14,650.43	7,767.59				49,093.00	2030	-14.00%
Total GHG emission in transport sector	Gg	10,985.32	9,928				5,348	2030	-20%
Total GHG emission in IPPU sector	Gg		519.29					2030	
GHG reduction against the BAU scenario by 11% reduction in the waste sector	Gg	657.9	657.9				2,549.00	2030	

Forestry	Unit, as applicable	Reference point(s), level(s), baseline(s), base year(s) or starting point(s){MPGs, p. 67, 77(a)(i)}	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii-iii)}				Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69-70 of the MPGs)
		2021 (BAU)	2021	Year 2	Year 3	End Year			
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreement: {MPGs, p. 65, 77(a)}									
Total GHG removals in Forestry sector	Gg CO ₂ -eq	Base year (2010): -3,611.8		NE			Increase in net removals compared to 2010 levels	2030	Net removals increased by 101 Gg CO ₂ -eq compared to base year, showing positive progress toward enhanced sink capacity
Forest cover increase	ha % of land area	29.15% (2015)		NE			32% of land area	2030	Land identification completed. Reforestation ongoing but below annual target of 2,000 ha. Management plans at 54% completion (271 of 500)
Quality improvement of growing stock	ha	Base (2021): 200,000 ha degraded forests identified		NE			200,000 ha restored	2030	Assessment tools nearly complete. Initial restoration work begun. Boundary demarcation advancing
Catchment protection	No. of plans & ha	Baseline (2021): 3 plans		NE			10 attachment management plans & associated planting	2030	Management planning on track. Tree planting meeting annual targets. Initial hazard assessments completed
Trees outside forests	No. of trees	Baseline: 100,000 trees/year		NE			1,000,000 trees	2030	Exceeding annual baseline in 2021-2022. Decline in 2023. Implementation mechanism established

Annex 22: Progress made in implementing and achieving the NDCs in Agriculture sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)
				2021	2022	2023			
NDC 1 - Climate change considerations mainstreamed into agriculture in Sri Lanka (2022)									
1.1	Enhance Adaptation of Climate Smart Agriculture (CSA) Technologies in Sri Lanka								
1.1 .1	Develop National Guidelines on Climate Smart Agriculture (CSA) Technologies and promote implementation	KPI: National Guideline on CSA published, Implementation on - Launched	Guidelines available on CSA	100%	-	-	100%	3 years by 2023	Already prepared the CSA (in 2019) and under implementation. The implementation progress is approximately 50%
1.1 .2	Develop and publish inventory of CSA Technologies for Sri Lanka	Inventory of CSA Technologies developed and published	CSA Technologies available	-	-	90%	100%	2 years by 2024	Inventory was prepared including Forty Climate Smart Agriculture Technologies and practices. The four prioritized CSA technologies established in farmer fields.
1.1 .3	Mainstream CSA technologies through Good Agriculture Practices (SL GAP) program	KPI: updated SL GAP including CR.	Guidelines available SLGAP standards established	5%	10%	20%	100%	10 years by 2030	New GAP farms certified Market development programs & farmer awareness programs conducted
1.2	Minimize climate (change) impact/risk in agriculture through climate forecast based agro advisories	Upgraded climate based Ag ri-advisory system exists, No of advisories issued	Spatial/ temporal accuracy and resolution of available system need to be further improved	100%	100%	100%	100%	10 years by 2030	Monthly advisories were issued based on the MET information. Monthly posters prepared based on agro met advisories in all 3 languages for the farmers and other stakeholders & published in DOA website.

1.3	Promote appropriate crop- livestock integrated farming systems in climate vulnerable regions (2022).	KPI: (I) Extents covered (ha) or % increase. (II) Number of farmers covered; (II) Number of integrated farming systems/models introduced	10%	20%	25%	35%	35%	5 years by 2025	Promotion activities are in progress. More details are available in DAPH
1.4	Promote home gardens as small- scale production systems with value addition and establishment of market channels (2022).	(i) Number of farmer markets established (ii)Number of forward contracts established (iii)Number of home garden models identified	Guidelines available in the home gardening Guidebook	20%	30%	40%	75%	5 years by 2025	Home gardens are often less included in market channel, but implementing in the ground level the as per the given guidelines
NDC 2 - Promote Integrated Pest Management (IPM) and Integrated Plant and Nutrition Systems (IPNS) in agricultural areas of most vulnerable area/districts/crops									
2.1	Develop approaches for rapid Identification of areas vulnerable to resurgence and emergence of pests/disease, weeds and wild animal attacks due to climate change.	KPI: Priority areas are identified (ii) Survey and data analysis reports (iii) Indicators for vulnerabilities	To a certain extent analysis and vulnerable site identification is done	20%	30%	40%	50%	4 years by 2024	Dry zone is the most vulnerable area to consider. Pest surveillance system for major pests of food crops were initiated. But IPM, IPNS and sustainable Agricultural practices are implemented whole over the Country
2.2	Develop and introduce appropriate IPM and IPNS programmes for selected crops in vulnerable areas	KPI: (i)Number of IPMs (ii)IPNS packages introduced, (iii)Number of farmers adopting these packages	IPM packages are already implemented for rice and vegetables	5%	15%	20%	40%	5 years by 2025	Technology developed to increase yield of rhizobium inoculated soybean under drought condition. Developed IPM package for durian pest and disease management Effective botanical for rice pest control was identified. Possibility of increase the progress more than 20% if more financial and technology assistance received
2.3	Increase SL GAP Certified products by 25% from areas which are highly vulnerable to climate change (2025).	(i)Number of GAP certified farmers, (ii)Number of markets for GAP	5%	Achieve expected KPI	10%	15%	20%	5 years by 2025	New GAP farms certified Market development programs & farmer awareness programs conducted. Farmers adopt slowly. Have done a training program to the local

		certified products, (iii) Quantities of GAP certified products marketed (iv) Number of promotional materials developed.		levels for each					farmers. More significantly impact on vegetable farming
NDC 3 - Develop/introduce varieties resistant/tolerant to biotic and abiotic stresses targeting most vulnerable agricultural crops to climate change									
3.1	Develop, introduce/promote heat tolerant varieties (2030).	% number of heat tolerant varieties introduced from those developed	30%	40%	45%	50%	100%	10 years by 2030	Development of heat tolerant varieties are in progress for food crops Recommended new bean variety and cucumber variety for dry condition
3.2	Develop, introduce/promote drought tolerant/escape varieties (2030).	% number of drought tolerant/escape varieties introduced from those developed	25%	35%	45%	50%	100%	10 years by 2030	Drought tolerant sesame variety was released for cultivation. Promising Dioscorea types were identified for Dry Zone cultivation. Two drought tolerant pomegranate varieties released. Recommended two Okra hybrids, two Elabatu Varieties, and 2 Manioc varieties and 2 rice varieties for low moisture stress conditions
3.3	Develop, introduce/promote excess soil moisture/flood tolerant varieties (2030).	% number of excess soil moisture/flood tolerant varieties introduced from those developed	10%	20%	30%	40%	100%	10 years by 2030	Submergence tolerant rice lines developing programs in progress
3.4	Develop, introduce /promote salt tolerant varieties (2030).	% number of salt tolerant varieties introduced from those developed	30%	37%	43%	50%	100%	10 years by 2030	Salt tolerant rice lines selected & testing in farmer fields. 6-7 salt tolerant varieties have already been developed and released.
3.5	Develop and promote pest and disease resistance /tolerant varieties (2030).	% number of pest and disease resistance /tolerant introduced from those developed	80%	83%	87%	90%	100%	10 years by 2030	4 rice varieties were recommended Have developed a plan for pest and diseases. Almost all crop varieties released by the DOA are tolerant to major pests and diseases. If any variety is found to be susceptible to pest and diseases or farmer field conditions, they are not released through variety releasing committees. Incorporating

										resistant genes tolerant to some pest and disease has also been conducted
3.6	Develop, introduce fodder varieties that withstand extreme climatic conditions (2030)	% number of fodder varieties that withstand extreme climatic conditions introduced from those developed	Baseline not identified	-	-	50%	Target not identified	10 years by 2030		Introduced some fodder varieties by livestock sector in coordination with Ministry/Department of Agriculture, Department of Animal Production and Health
NDC 4 - Revisit the Agro Ecological Regions (AERs) maps of Sri Lanka with current and future climate scenarios and recommend appropriate crops for different regions to reduce vulnerability to climate change impacts										
4.1	Expanding the Argo-met observation network to cover the most vulnerable AER to climate change (2025).	AER zones covered	40%	-	45%	50%	100%	10 years by 2030		New agro-met station was established at Pelwehera and renovate observatories in 11 locations. Data collection procedure was improved & database updated.
4.2	Conduct studies related to soil moisture regimes covering most vulnerable AER to climate change (2028).	5 studies	25%	-	30%	40%	100%	7 years by 2028		Ongoing studies on soil moisture. Two-year plan.
4.3	Most vulnerable AERs are re-demarcated into sub zones to make recommendations for specific crops (2030).	AER Map	25%	-	30%	40%	100%	10 years by 2030		Focus on changing map boundaries based on the information obtain from Meteorological Department
NDC 5 - Enhance sustainable land and water management practices in areas where anticipated climate vulnerability is severe										
5.1	Promote input efficient farming methods / systems covering the target area by 50% in 2025 and 100% by 2030.	Input efficient farming systems established	30%	30%	35%	40%	100%	10 years by 2030		Input efficiency systems were introduced (Fertigation system). Introduced input efficient farming methods (alternative wet and dry methods). High density planting of mango and pineapple
5.2	Promote farm rainwater harvesting to cover the target area by 75% (2025).	Rainwater harvesting mechanisms established	30%	30%	35%	40%	75%	5 years by 2025		Introducing and establishment of RWHS is in progress
5.3	Promote storm water management in 25% of the target area (2025).	Area covered	5%	5%	6%	7%	25%	5 years by 2025		Using for ground water recharging
5.4	Promote crop diversification with input efficient and climate change tolerant varieties in 50% of the target area (2030).	Crop diversification packages established under irrigation schemes	25%	-	30%	35%	50%	10 years by 2030		Crop diversification research in progress and ongoing new diversification projects

5.5	Restoration of small tank cascades and individual tanks to cover the entire target area (links to water sector 2030).	Small tank irrigation systems restored	30%	30%	-	35%	70%	10 years by 2030	Rehabilitation of 161 cascades through foreign funds. Small tank projects manage through Department of Agrarian Development.
5.6	Promote and apply soil conservation measures in 50% of the target area (2028).	Soil conservation measures established	25%	-	35%	35%	50%	8 years by 2028	Works in progress targeting upcountry areas in consultation with National Building Research Organization
NDC 6 - Enhanced early warning and risk management mechanisms introduced to reduce climate change vulnerability									
6.1	Improved seasonal climate forecasting for Maha and Yala (2024).	Improved Seasonal Forecast Launched	25%	30%	40%	50%	75%	4 years by 2024	Number of committee members of agro-met advisory increased to give more precise information to regional level, Weather advisories expanded to wide range of crops, MET issues short term and long-term future predictions
6.2	Promote provision of simplified and timely climate forecast-base advisory communication to farmers and field-level officials in agriculture (2025).	Communication network established and operational	40%	-	45%	50%	75%	4 years by 2025	Simplified agro-met advisories prepared (Met Department & NRMC) and published as a poster and widely distributed to the farmers through Mahaweli Authority, Department of Irrigation, Department of Agrarian Development and Department of Agriculture.
6.3	Strengthen risk management and risk transfer mechanisms in agriculture (2025).	Agriculture Insurance mechanism in place and operational; Increased number of farmers enrolled in the process	40%	-	45%	50%	100%	4 years by 2024	All the farmland cultivated main 6crops (paddy, maize, big onion, soyabean and potato) are insured under AAIB since 2018 onwards which is free for the farmers. This scheme is available for all other crops and farmers can enrol by paying the premium
6.4	Strengthen early warning systems/advisory for climate hazards and pest and disease risks (2025).	Mechanism in place and operational; Number of farmers using early warning advisory	25%	-	30%	30%	50%	4 years by 2025	In progress
6.5	Introduce climate related crop forecasting to reduce post-harvest losses (2025).	MOSAICC based Crop forecasting done	15%	-	18%	20%	100%	4 years by 2024	In progress
6.6	Promote protected agriculture and other technologies for climate risk management (2025).	Area under protected agriculture	20%	-	-	40%	50%	8 years by 2028	Suitable vegetable varieties identified for Polly tunnel cultivation. Optimization of vegetable seed production technology under protected house

Annex 23: Progress made in implementing and achieving the NDCs in Fisheries sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)
				2021	2022	2023			
NDC 1 - Ecosystem-based Approach to Fisheries Management (EAFM) adopted in areas of high climate vulnerability to enhance resilience (2030)									
1.1	Identify priority limits and define fisheries management areas based on ecological principals	No. of fisheries management units identified	Not Commenced			Identified and Plans of small pelagic management area from Kaluthara to Puttalam (West and Northwest) are completed.	05 priority areas selected	2023	Priority areas were identified and covering Western and Northwestern regions (Kaluthara to Puttalam area), plans of small pelagic management areas were completed.
1.2	Develop 5 EAFM plans	No. of EAFM plans developed in gender responsive manner as appropriate	Not Commenced			Started developing of lobster management plan for Hambantota district	5 EAFM Plans developed	2023-2025	DFAR initiated the development of a lobster management plan for the Hambantota District, aligning with the NDC targets to enhance sustainable fisheries management. The plan's continuation and full implementation require additional funding to meet these targets effectively. Currently, no funds from the World Bank are allocated for advancing this process, which may hinder the achievement of targeted outcomes.
1.3:	Conduct survey/s to estimate women's participation / contribution in the Fishery sector	Initial Surveys, No. of surveys updated for the year.	Not Commenced			Not started due to lack of funding.	1. Initial surveys conducted by 2023 2. two Surveys updated per year	2023-2030	The activity has not commenced due to insufficient funding.

1.4	Incorporate EAFM into 5 prioritized existing fisheries management areas declared under Fisheries and Aquatic Resources Act	No. of EAFM incorporated fisheries management areas	Not Commenced		Work started	Established 20 fisheries management committees and fisheries district coordination committees. 112 fisheries management areas are gazetted according to the fisheries act.	05 existing fisheries management areas incorporated with EAFM	2022-2030	Work initiated and in progress. To advance the target of incorporating an Ecosystem Approach to Fisheries Management (EAFM) in five fisheries management areas, 20 fisheries management committees and fisheries district coordination committees have been established. Additionally, 112 fisheries management areas have been officially gazetted under the Fisheries Act, enhancing the regulatory framework for sustainable and ecosystem-focused fisheries management.
1.5	Build awareness and capacities of all key stakeholder agencies on gender issues in the sector	No. of awareness programmes conducted, No. of participants received awareness training	Some work initiated, but awareness programs not conducted			Not started due to lack of funding.	Targets of the two indicators to be established	2023-2030	The activity has not commenced due to insufficient funding.
1.6	Amend existing legislative framework, where necessary to enable gender integration	Legislative framework enabling gender inclusion	Draft policy and act pending Cabinet approval, Pension scheme established to include fisher spouses & dependents			Drafted new fisheries act has been sent to the Cabinet approval.	Amended legislative framework where necessary	2023-2030	Work initiated and in progress. To advance the target of amending the legislative framework where needed, a newly drafted Fisheries Act has been submitted for Cabinet approval.

1.7	Implement 5 EAFM plans	No. of EAFM Plans Implemented	Not commenced			Plans of small pelagic management areas are completed in Kaluthara to Puttalam Districts.	05 EAFM Plans implemented	2023-2030	Work initiated and in progress. To achieve the target of implementing five Ecosystem Approach to Fisheries Management (EAFM) Plans, small pelagic management area plans have been finalized for regions spanning from Kaluthara to Puttalam Districts.
1.8	Target an appropriate percentage of women in introducing climate change responsive new technologies and systems	% of the women participation Programmes for the introduction of climate change responsive new technologies and systems	Above 10%			Not started due to lack of funding from World Bank.	Not less than 25% of women reached out/included in promoting climate resilient programmes	2023-2030	The activity has not commenced due to insufficient funding.
NDC 2 - Expand aquaculture and culture-based fisheries to address food security issues relating to climate change (2025)									
2.1	Promote an appropriate fish fingerling stocking programme for enhancement of culture-based inland fisheries	No of fingerling stock, Annual inland fish production	110 Mn fingerling stock , 104,000 MT	Stoking – 110 Mn Production -104 KMT	Stoking – 146.6 Mn Production – 116 KMT	Stoking –71.82 Mn Production - 114,850 Mt	1. 500 Mn fingerling stock Target of inland fish production 1, 55,600 Mt.	2021-2025	NAQDA sets and revises its annual and bi-annual stocking and production plans to meet NDC targets. This includes a production goal of 155,600 metric tons and stocking of 500 million fingerlings. In 2023, NAQDA achieved a stocking level of 71.82 million fingerlings, resulting in a production output of 114,850 metric tons.
2.2	Establish fish barricade devices for 50 perennial reservoirs impacted with frequent floods to prevent fish escape, in consultation with Irrigation Department	No of tanks covered	None		50 no. of fish barricade devices established		50 no. of fish barricade devices established	2021-2022	This activity was successfully completed, achieving the target by installing 50 fish barricade devices in main reservoirs through NAQDA's Extension Network.
2.3	Promote culture of species appropriate for changing climate	No. of species of fish	1	Work ongoing	Work ongoing	Climatic resilience Tilapia Pond culture project. Identification of	At least 2 new fish species by 2030	2021-2030	Work initiated and in progress. Climatic resilience Tilapia breeding program and introduction of carp species to tolerate and grow in low temperature areas.

						genetically drifted Brooders for off seasonal breeding. Information gathering is in progress			
2.4	Conduct survey/s to estimate women's participation/contribution in the aquaculture Fishery sector	1. Initial Surveys 2. No. of surveys updated for the year	Not Commenced			Not started due to lack of funding.	1. Initial surveys conducted by 2023 2. Two surveys updated per year	2023-2030	No required funding to achieve targets. Institutional wise data collection conducted through Extension officers of NAQDA. National level or project wise survey not conducted due to lack of funding.
NDC 3 - Breeding of climate change resilient and commercially important aquatic resources (2025)									
3.1	Cryopreservation facility in Dambulla expanded for stocking fish sperms for artificial breeding of species where effective spawning affected due to climate induced changes	No. of samples preserved	300 samples preserved	Work continues	Work continues	287 samples are preserved	Annually 300 samples	2021-2025	The work is ongoing, with 287 valves prepared and preserved in 2023. NAQDA has acquired advanced equipment to enhance capacity and support technological advancements in the cryopreservation lab, facilitating gene coding identification and gene mapping.
3.2:	Convert 52 number of existing open breeding facilities into indoor facilities and design constructions enabling controlling temperature and salinity for breeding tolerant strains of selected species	No. of hatcheries developed/improved	5	03 completed in 2021	10 centres converted	No progress due to lack of funding	52	2021-2025	Two hatchery conversions have been completed, while 10 additional planned conversions were halted due to insufficient funding. Without the necessary funds, achieving the NDC targets remains challenging.
NDC 4 - Increase the production capabilities of fisheries, aquatic resources in 30 lagoons which are highly vulnerable to climate change (2030)									
4.1	Identify vulnerable lagoons (by 2022) and prepare lagoon profiles for 18 lagoons	1. No. of vulnerable lagoons identified 2. No. of lagoon	5 lagoon profiles up to 2020 Data collected for 07	development of lagoon	development of lagoon profiles	03 No. s of Lagoon profiles completed (Nayaru,	18 lagoon profiles developed	2021-2030	02 No's IEE for Nanthikadal & Arugambay submitted. Baseline Data collected/being collecting for 08 lagoons namely, Nayaru, Chalei, Koggala, Rathgama, Kalamatiya,

		profiles developed	lagoons (05 in 2017 and 02 in 2019)	profiles continues	continues	Nanthikadal, Arugambay)			Thondamanaru, Lankapatuna& Jaffna. Three Lagoon profiles completed (Nayaru, Nanthikadal, Arugambay).
4.2	Carrying capacity assessment of 18 lagoons	No of carrying capacity assessments completed	None			Baseline data collection for lagoons continues. Further no required fund for carrying capacity assessment.	18 Lagoons	2023-2030	Baseline data collection for lagoons is ongoing. However, no funds are currently available for the carrying capacity assessment, which is necessary for further progress.
4.3	Declaring and managing 10 lagoons as Co-managed Fishery Management Areas (FMAs)	1. No of Lagoons gazetted/declared 2. No of co-management groups established 3. No of management and development plans prepared and implemented	1. 36 Gazetted (by 2017) 2. None 3. None	7 gazetted	None	Three management and development plans for the Chillaw, Garaduwa, and Koggala lagoons are set to be gazetted. (The legal drafts have now been forwarded for printing by the government press.)	1. 10 lagoons 2. 10 lagoons 3. 10 lagoons	2022-2030	Work has been initiated and is currently in progress. Management and development plans for the 3 lagoons are prepared and are set to be gazetted. The legal drafts for these plans have already been forwarded to the government press for printing.
4.4	Minimize aquatic pollution in above 10 lagoons mentioned in 4.3	No of lagoons where aquatic pollution minimized	Feasibility studies in 4 lagoons in progress (Arugambay, Nandikadal, Nayaru, Lanka Patuna)	Water testing continues in the two lagoons	Water testing continues in the two lagoons	IEE studies for Arugambay and Nanthikadal Lagoons were completed and BOQs, estimates are being prepared accordingly. Pollution levels are being	10	2021-2030	Plans are in place to begin the cleaning of both Arugambay and Nandikadal lagoons this year. For Arugambay Lagoon, the IEE study has been completed by NARA, and the BOQs and estimates have been prepared by the consultant accordingly. The IEE study for Nandikadal Lagoon has also been completed, and the BOQ and estimate are currently being prepared. Additionally, pollution levels in Chilaw, Puttalam, Chalei Nayaru, and Koggala lagoons are being assessed.

						assessed in Chilaw, Puttalam, Chalei Nayaru & Koggala lagoons			
4.5	Promoting aquaculture of selected climate change resilient, high value food species in selected lagoons	No of species identified as climate resilient	Feasibility studies being conducted			Pilot project on Sea bass culture completed in Rekawa lagoon-2023, Feasibility study was conducted at Thondamanaru lagoon for select potential aquaculture species & black tiger shrimps restocking.	5	2021-2030	Work has been initiated and is currently in progress. The pilot project on sea bass culture in Rekawa Lagoon was completed in 2023. Feasibility study was conducted at Thondamanaru Lagoon to assess the potential for restocking black tiger shrimp and other suitable aquaculture species, further enhancing the sector's resilience to climate change.
NDC 5 - Enhanced safety at sea against climate change influenced extreme conditions (2025)									
5.1	Promote applicable measures to enhance safety at sea	No. of applicable measures identified No. of incidents reported	Some guidance on applicable measures are provided in the Act. No. of incidences to be identified	Developed to some extent, further development needed. (such as- there is no technology for mobile communication Rescue vessel required, Including	Developed to some extent, further development needed. (such as- there is no technology for mobile communication, Rescue vessel	Work in progress. Two rescue vessels to be granted by JICA	Identify the exact applicable measures at least by 2023. 10% reduction of incidences	2021-2025	Work is in progress. Two rescue vessels are scheduled to be provided by JICA to enhance maritime safety and response capabilities.

				small-scale fishers)	required, Including small-scale fishers)				
5.2	Enhance effective early warning transmission systems for fishers (including small boats and traditional crafts) and insurance schemes	50% of the coastal fishers using effective early warning transmitting system such as CDMA	Current systems are not effective	SMS based early-warning system is launched and in operation	About 100,000 users of the SMS based systems	SMS users have been increased by downloading the “Sayura” App	At least 50% of the coastal fishers use effective early warning transmission systems	2021-2025	Work is in progress with the launch of an SMS-based early warning system, which is now operational. The number of users has increased through the download of the “Sayura” App, contributing towards the target of at least 50% of coastal fishers using effective early warning transmission systems.
5.3	Establishment of an efficient weather information management and communication system (VMS) including satellite-based vessel monitoring system to ensure safety at sea	% of multiday boat equipped with VMS, % of multiday boats equipped with AIS	VMS older version Few boats with AIS			Data satellites are currently installed by the vessel monitoring unit. All multiday fishing vessels are equipped VMS systems. One day fishing vessels and outboard engine vessels will not have a safety monitoring system.	1. Establishment of an efficient weather information management and communication system including satellite-based vessel monitoring system (VMS) to ensure safety at sea. 2. 100% by 2025	2023-2030	Work is in progress, and all multiday fishing vessels are being equipped with VMS (Vessel Monitoring Systems).
NDC 6 - Diversification of livelihoods of fisher folk to build resilience to climate change									
6.1	Enhance access to credit, inputs training for diversification of livelihoods of the vulnerable fisherfolk	No. of schemes for livelihood diversification NO of fisherfolk who had diversified their livelihoods	None	No specific activities implemented	No specific activities implemented	No required funding	Target to be set	2021-2030	No required funding to achieve targets.

6.2	Allocate a percentage for women fisherfolk in carrying out knowledge transfer activities, training sessions, extension programmes, providing credit facilities, production inputs, etc.	Percentage of women fisherfolk included in carrying out knowledge transfer activities, training sessions, extension programmes, providing credit facilities, production inputs, etc. No. of women accessing credit, production inputs	Not recorded			No required funding for implementation	Activities have been conducted but gender disaggregated data not recorded	2023-2030	No required funding to achieve targets.
6.3	Assist finding high value markets to deal with reduced yields	No. of high-value markets established	None			No required funding for implementation	Target to be established	2023-2030	No required funding to achieve targets.
6.4	Facilitate value additions through diversification of fisheries related products (fish oil, fish sauce and other value-added products)	No. of value-added products introduced annually	No specific products introduced			Under the USAID project, site selection has been completed.	Target to be established	2023-2030	USAID project facilitating (in-kind grant assistance) for reduce post -harvest losses due to climatic change impacts in southern province
NDC 7- Conduct fisheries and aquatic resources research targeting building resilience to climate change (2030)									
7.1	Assess climate impacts on fisheries and aquatic resources	No. of assessments conducted annually No. of areas covered in Climate impact assessments (Fisheries -	Climate change research is limited, with insufficient data for assessments, and two proposals	No progress	No progress	Assess climate impacts on fisheries and aquatic resources	Target to be established	2021-2030	Research and data collection have been conducted; however, they do not specifically focus on climate change impacts, and the data collected is insufficient for comprehensive assessments. A lack of funding remains a significant constraint in advancing these studies.

		Marine, Aquaculture & Inland fisheries, Aquatic resources - Habitats, Coral reefs, Mangroves, Sea grass, Salt marsh	remain unfunded.						
7.2	Develop reef monitoring systems to provide early warning alerts of bleaching events	No. of Reef monitoring systems	Monitored 02 reefs annually for the reef status Four data loggers are available (but not real-time monitoring, which is essential for a reef monitoring systems)	No progress	No progress	Develop reef monitoring systems to provide early warning alerts of bleaching events	04 automated real-time data monitoring systems (02 each for West coast and East coast). 02 by 2025 and 04 by 2030	2021-2030	No required funding to achieve targets.
7.3	Identify adaptation measures in fisheries for ocean acidification related impacts	No. of Automated monitoring systems for ocean acidification measurements, No. of Adaptation measure/s for ocean pacification	Ocean acidification measurement is done in two selected locations (East coast and west coast), but the measurement process is manual.	No progress	No progress	Identify adaptation measures in fisheries for ocean acidification related impacts	04 Automated monitoring	2021-2030	No required funding to achieve targets.
7.4	Installation of artificial reefs where substrate	No. of artificial reefs installed	Small-scale artificial reefs were piloted in 04 locations	No progress	No progress	Installation of artificial reefs where substrate for settlement of	At least four locations	2021-2030	No required funding to achieve targets.

	for settlement of corals larvae is minimal		(Polhena, Galle, Sinnapadu and Weligama)			corals larvae is minimal			
7.5	Deployment of fish aggregating devices in identified areas	Studies to identify No. of locations, Deployment	Studies conducted in four locations to identify the feasibility for deployment.	FAD deployment was hindered by insufficient funds, with some resources reallocated to DFAR for the task. The remaining funds supported research on harvesting underutilized fish resources using modern equipment	there was no Project was carried out on FADs	FAD monitoring project is in progress. Obsolete vehicles deployed in Trincomalee was observed in March, and data were collected data and samples were collected for physicochemical and biological parameters analyses, are in progress. Acoustic survey also carried out in August, to assess fish stocks	Comprehensive assessment by 2025, 05 devices	2021-2025	A Fisheries Aggregating Device (FAD) monitoring project of NARA is currently in progress. Data collection on physicochemical and biological parameters is underway. An acoustic survey was conducted to assess fish stocks in the region.
7.6.1	Introduce solar panel systems to multiday fishing vessels and fish processing factories	No. of multiday fishing vessels installed with solar panels	None			NPD approval not granted for implementation	All multiday fishing vessels installed with solar panels (approximately 5,500)	2023-2030	Implementation has not been conducted due to the necessary approvals not being granted.

Annex 24: Progress made in implementing and achieving the NDCs in Livestock sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)
				2021	2022	2023			
NDC 1 - Introduce adaptation measures to address adverse impacts of climate change on ruminant livestock									
1.1	Identify and promote appropriate adaptation measures, technological innovations and resilient farming systems including heat stress management	Recommended adaptation measures Number of technological innovations adopted	0 (for all the activities)			Not commenced	In 50% of the existing farms having adaptation measures using technological innovations	2023-2030	Introduced misters & coolers, ventilation fans and Sprinkler irrigation systems for dry zone large scale farms. Introduce By-pass fat diet to reduce GHG emission at experimental level, couldn't promote due to high cost. Need funds to introduce solar system to reduce energy cost.
1.2	Promote integration of rainwater harvesting ponds into medium and large farms	Number of ponds adapted by medium and large-scale farms	0			Not commenced	Established in 50% of the farms in the dry zone	2023-2026	Established and maintain ponds at NLDB farms in dry zone.
1.3	Introduce adaptation measures such as forage conservation, modification of feeding systems to respond to early warnings on extreme weather events	Number of farmers adapting these technologies, by sex disaggregated data	0			5% farmers adapted to new technology	Number of farmers – 50%	2023-2025	Introduced silage conservation practices at small, medium and large-scale farms, Bailing project at Polonnaruwa NLDB farm. Hay bailing using simple technology.
1.4	Introduce/ develop high yielding and climate adaptable new forage and feed resources	Number of varieties & feed resources promoted and adopted	3			2 new variety introduced two districts	2 new varieties	2021-2025	Target level achieved with two new varieties have developed by the VRI.
1.5	Continuous monitoring/ improved surveillance by veterinary services to detect and respond to new/re-emerging (Leptospirosis, Tick-borne, etc.) climate related diseases	Surveillance of new and re-emerging diseases or outbreaks	0			Brucellosis surveillance in progress (Cattle)	Annual surveillance	2023-2030	Brucellosis surveillance in cattle is currently underway. Monitoring efforts are focused on detecting and managing the disease to ensure the health and safety of livestock populations.

NDC 2 - Introduce technological innovations and interventions to build resilience in poultry and swine farming									
2.1	Facilitate small-scale operators to adopt climate-resilient housing and management practices to reduce heat stress	Number of training sessions conducted. Sex disaggregated data of participants. Facilitation of uptake recommended adaptation measures. Number of improved animal housing	Awareness programmes being carried out but not in a planned manner			2 % farms adapted climate-resilient housing	Target need to be set for the number of training sessions. 50% of existing farms adopting adaptation measures to reduce heat stress. % of women farmers adopting (out of the above 50%)	2023-2026	Facilitate construction of sheds to promote intensive/ semi-intensive farming. Not introduced due to high cost.
2.2	Continuous monitoring/ improved surveillance by veterinary services to detect and respond to new/re-emerging climate related diseases in poultry and swine	Surveillance of new and re-emerging diseases or outbreaks	0			HPAI surveillance in progress (poultry)	In all the farms	2023-2026	Surveillance for Highly Pathogenic Avian Influenza (HPAI) in poultry is currently underway, alongside ongoing testing for Salmonella HPAI.
2.3	Promote expansion of existing adaptation measures such as modification of feeding systems to manage available feed in responding to early warning systems on extreme conditions	Number of modifications / formulations	0				2	2024-2027	The work is scheduled to commence in 2024 and has not yet been initiated.
NDC 3 - Improve research, education awareness, and capacity building for climate change adaptation									
3.1	Technology and knowledge transfer to implement adaptation measures, considering gender sensitivity in livestock sector	Technology transfer assessment. Knowledge and technology transfer packages are developed & delivered for relevant target groups (gender and youth components). Sex disaggregated data indicating numbers of women farmers reached	0				Overall technology and transfer assessment conducted (2024) Knowledge transferred to not less than 50% livestock farmers	2024-2030	The work is scheduled to commence in 2024 and has not yet been initiated.

		with technology and knowledge transfer							
3.1.1	Conduct a gender assessment and analysis for the livestock sector to identify main gender issues in the sector relevant for adaptation, and to set a baseline	Sector gender assessment (Women's involvement in the sector, related gender issues, barriers and challenges)	Some studies available, scattered information				sector gender assessment	2022-2023	Not implemented due to lack of funds.
3.1.2	Incorporate gender issues identified in activity 3.1.1 in identifying, developing and promoting technological innovations, adaptation measures, resilient farming systems	Gender responsive adaptation measures, technological innovations	Gender issues not emphasised				Gender issues incorporated	2023-2030	The project aimed at empowering women livestock farmers through subsidies was initiated in 2020 but was not continued as it did not align with the identified issues.
3.1.3	Plan and implement activities to engage and target women livestock producers in the promotion of all adaptation measures in the NDC action plan (technological developments, resilient farming systems, forage conservation, feeding systems, processing and marketing mechanisms etc.)	Women livestock producer engagement	Not emphasised				Not less than 30 % of women livestock producers engaged	2023-2030	Not implemented due to lack of funds.
3.1.4	Encourage women scientists/researchers/technicians/Extension Officers, in developing and introducing adaptation measures recommended in the NDC action plan for the livestock sector in planning and decision-making positions	Percentage of women scientists/researchers/technicians in planning/decision making	Not emphasised				Not less than 40%	2023-2030	Not implemented due to lack of funds.
3.2	Conduct awareness and educational programmes on climate resilience in livestock activities	No. of local level extension Officers trained by DAPH (ToT). No of livestock farmers trained by PDAPHs	Not emphasised				25 per year 800 per year	2024-2030	The work is scheduled to commence in 2024 and has not yet been initiated.
3.3	Capacity building of all service providing institutions in the livestock sector to promote	No of trainings received by each institution. Capacity building	Not emphasised				01 training per institution per year	2023-2030	Not yet implemented.

	resilience building measures discussed in NDC 1 and 2	material/modules incorporate gender issues. No of women participants attended							
3.4	Access to risk management and financing to support adaptation to climate risks and changes	No. of farmers registered for insurance. Number of women farmers registered	Less than 10%				Over 60% livestock farmers have access to insurance schemes	2021-2030	Not yet implemented.
3.5	Review and revise existing training curricular in universities offering veterinary and animal production-related degree programmes and in the Department of Animal Production and Health in addressing climate vulnerability	No. of modules/courses addressing climate vulnerabilities, No. of modules/courses addressing gender issues in climate vulnerabilities on adaptations in the livestock sector	0			Incorporated in progress to Animal Husbandry School diploma curriculum	The integration of climate change into the curricula in veterinary medicine & animal production	2023-2030	The inclusion of the subject in the benchmark statement has not been completed, but efforts to incorporate it into the Animal Husbandry School diploma curriculum are currently underway. An awareness program is being requested, with funding needed for its implementation.
3.5.1	Collect sex disaggregated data for all relevant activities in the adaptations NDCs	Formats for collection and analysis of sex disaggregated data developed and introduced	0				Practice of collection, analysis of sex disaggregated, facts enabling gender responsive NDC implementation	2023-2030	Not yet implemented
3.6	Research and development to identify climate-resilient breeds/varieties and new technologies for livestock management	Climate resilient breeds and fodder varieties identified. Technologies developed	Work in progress			01 research on fodder variety in final stage. Semen import support done.	2 new breeds, 3 new fodder varieties, 3 New Technologies	2021-2030	01 research study on fodder variety is nearing completion. Support for semen imports has been provided, and plans are in place for another research project on a different fodder variety.

Annex 25: Progress made in implementing and achieving the NDCs in Water sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)	
				2021	2022	2023				
NDC 1 - Integrated River Basin Management (IRBM) approach adopted in 15 prioritized river basins in Sri Lanka										
1.1	River basin wide vulnerability, risks and capacity assessments carried out in 15 river basins in Sri Lanka.	Number of Assessments completed in river basins	10 completed under CRIP	No Work Done	No Work Done	No Work Done	15	2021-2025	Three basins included in the target list were completed in previous years (Kalu Ganga, Mee Oya, Mundeniaru). These should be included in the baseline.	Following the completion of the CRIP project, budgetary constraints prevented the achievement of the intended targets. Additionally, the departure of trained engineers from the engineering service has created a gap in technical expertise, highlighting the need for capacity-building efforts to
1.2	Climate change adaptation considerations built into integrated river basin management planning initiatives of Sri Lanka	Number of integrated plans	6 completed under CRIP	4	No Work Done	No Work Done	15	2021 - 2026		
1.3	Water resource development and management plans for the selected 15 river basins are prepared.	Number of water resource development and management plans	6 completed under CRIP	4	No Work Done	No Work Done	15	2021-2030		

1.4	Integrated River Basin Management (IRBM) plans are prepared (by 2025) for at least five critical river basins and implemented. (Five basins identified are Kalani, Attanagalu, Mahaweli, Malwathu, Gin)	1. Number of IRBM plans prepared	1. None	4 feasibility studies completed except Gin Ganga	No Work Done	1. No work done in 2023	1. Five (5) by 2025	2021 - 2030	Attanagalu - Basnagoda reservoir Project Malwathu oya - Lower Malwathu oya Reservoir Project Mahaweli - NCPC Project, NWPC Project & Minipe LB Project. Progress cannot proceed due to financial issues	train new personnel with the skills required to conduct these assessments effectively. It is highly recommended to expedite the recruitment of engineers for the engineering service.
		2. Number of IRBM plans implemented	2. None			2. 05 projects which were started in previous years under 03 basins are in progress	2. Five (5)			
1.6	Harness excess water in selected river basins to storage facilities elsewhere through trans-basin diversions	Number of feasibility studies	Upper Elahera canal & Wayamba Ela (NWP diversion) under MWSIP in progress, Uma oya diversion to Kirindi oya in progress	Baseline projects are on progress		Baseline projects completed Gin Nilwala Diversion Project studies is in progress	Three (3)	2021 - 2027	The Gin Nilwala Diversion Project could not be completed due to environmental and social matters.	
1.7	Enhancement of water retention/recharge in catchments using appropriate measures such as ecosystem restoration, tree planting, small ponds, check dams to enhance climate resilience	Number of initiatives	None			Two catchment areas are in progress	Target to be established (5 priority basins are there)	2023 - 2025	Mahaweli Basin – Upper Mahaweli Catchment management (started in 2021) & Knuckles project (started in	

									2022) are in progress
NDC 2 - Ground and surface water monitoring in the Northern, North Central and North-western provinces and other areas of high drinking water vulnerability to drought									
2.1	Conduct risk assessments and contingency plans for all new drinking water projects in priority areas								
2.1.1	New drinking water projects	Number of new projects with risk assessments and contingency plans	18 (out of 44 A1 projects)	15	36	19	143	2021 - 2030	A total of 70 new drinking water projects have been launched, achieving 49% of the 2023 target, but delays in NPD approval and the need for financial and technological support for advanced water treatment facilities remain critical. The NWSDB's Corporate Plan for 2024–2029 is under review and will guide project revisions and future strategies.
2.1.2	New community-based drinking water projects	Number of new projects with risk assessments and contingency plans	23	245	405	247	4000	2021 - 2030	A total of 897 new community-based drinking water projects have been introduced, achieving 22% of the target by 2023
2.2	Seek new water sources and options (i.e. rainwater harvesting and sub surface water) to augment water supply in areas where supply is scarce								
2.2.1	Seek new water sources and options – Surface and sub surface water	Number of ground Water Sources approved	None		4 (Glenore, Mankulam, (Lunuwatta & Musali WSSs)	5 Lahugala WSS	6	2021 - 2030	5 shallow wells & pumping tests were completed. 894m3/d recommended to pump.
		Number of Surface Water Sources approved	2. 165	48	51	2	253	2021 - 2030	A total of 101 new community-based drinking water projects have been introduced, achieving 40% of the target by 2023

2.2.2	Seek new water sources and options – Promote rainwater harvesting (RWH)	Number of Rainwater harvesting systems (RWHSs) installed	48,000 (cumulative) by SLRWHF 800 (cumulative) by LRWHF	2334	953	456	Additional 20,000 (10,000 by DNCWS)	2021 - 2030	DNCWS has installed a total of 101 RWHSs, achieving 37% of the target by 2023.
				158	154	218	Additional 20,000 (10,000 by LRWHF)		LRWHF has installed 451 RWHSs in households and 79 in schools, achieving 5% of the target by 2023.
		Number of RWHS with well water recharging systems installed	800 (cumulative) by LRWHF	109	66	111	Additional 5,000 (by LRWHF)		LRWHF has installed 286 RWHSs with well water recharging systems, achieving 6% of the target by 2023.
2.3	Mitigation of drought impact by establishing “Provisional” (Standby) deep wells on risk prone districts	No of investigation reports of provincial sources (new and existing wells) in identified areas	100 reports	175	75	202	Additional 2,000 reports	2021 - 2030	A total of 452 reports has been completed, achieving 23% of the target by 2023
		No of provisional wells established (constructed/ rehabilitated) within the risk prone areas	50 wells	NWSDB - 60 WRB - 20	NWSDB - 40 WRB - 5	NWSDB - 61 WRB- 10	1,000 wells		NWSDB and WRB have introduced 161 and 35 wells, respectively, achieving 20% of the target by 2023
2.4	Identify and implement appropriate groundwater recharge systems of the water deficit areas	No. of areas feasible for implementing groundwater recharge systems	One area	WRB - Identified 1 area	WRB - Identified 1 area	WRB - Identified 1 area LRWHF - 4 area	10 areas	2021 - 2030	WRB has identified 3 areas, and LRWHF has identified 4 areas which are Mannar, Mullaitivu, Anuradhapura , and Badulla
		No. of large-scale groundwater recharge systems installed	One (Wariyapola)	LRWHF - 109	LRWHF - 66	LRWHF - 111	Additional 10 = One per year (Cumulative 11)		LRWHF has introduced 286 ground water recharging RWH systems
2.5	Ensure water security at all times with the required quality and quantity of water	% No of samples tested satisfied for microbiology and physical parameters against no of samples tested	99%	No data	bacteriology satisfied 98.07% Physical satisfactory 90.87%	bacteriology satisfied 97.73% Physical satisfactory 87.24%	100%,	2021 - 2030	Some water treatment plants have to be improved to achieve water quality satisfaction, which requires more funding.

		Total quantity (MCM/day) produced and delivered per day (pipe borne)	14 MCM/day,	23	2.24	2.68	5.3 MCM/day,		Under Water for all projects, the target was to achieve 5.3 MCM/day in 2030. However, with the funding limitations, the proposed projects not implemented.
		Number of wellhead protection established,	0	0	0	8 well head protection (40%)	45,		Funds are required for field data collection, testing, surveying, and water quality testing. Capacity building for equipment handling and financial support is also needed for conducting community awareness program
		Total no. of new schemes with required quality (SLS 614, based WHO guidelines),	None	123	268	11 - completed 233- on going	1,000 new schemes (under PrajaJala Abimani 1000 village programme) implemented by DNCWS),		A total of 452 reports has been completed, achieving 23% of the target by 2023
		5. % of Rural water Supply Schemes (RWSSs) Rehabilitated to ensure required water quality (SLS 614 WHO guidelines)	Baseline to be established.	41	323	82	100% (Note: DNCWS will rehabilitate 4,000 registered community water schemes)		A total of 446 water schemes has been rehabilitate by DNCWS.
2.5.1	Climate resilient Water safety plans for WSSs	No of scheme specific Water Safety plans	28 by NWSDB and DNCWS	NWSDB -21 DNCWS - 245	NWSDB -39 DNCWS - 405	NWSDB - 50 DNCWS - 247	344 WSSs (NWSDB) and 4,000 Community water schemes (DNCWS)	2021 - 2030	NWSDB has conducted Water Safety Plan Internal Formal Audits for 110 WSSs and DNCWS have introduced water safety plans for 897 WSSs, respectively, achieving 32% & 22% of the target by 2023.

2.6	Establish sustainable extraction levels of ground water in at least three river basins (by 2025) and expand coverage by further three river basins	No of ground water resources tested for extraction commercial & industrial scale)	None			01 River basin	At least 3 by 2025 and further 05 by 2030 (Total 8)	2023 - 2030	
NDC 3 - Promote climate-resilient water supply schemes									
3.1	Establish new technology in real time measurement of water quality and level on major water sources in a collaborative manner with water sector institutions	A System for real-time measurement of water quality and level on major water sources, No of real time monitoring stations for water quality measurement, A central database	Some systems available at agency level, without central coordination, One (Kelani River at Amgatale), Not available	Work continues on the water quality measurements in Kelani River	Work continues on the above	Planning to be establish system for Mahaweli River	Established system (by 2025), Three by 2028	2021 - 2028	
3.1.1	Promote RWH for domestic use with regular testing and monitoring	A System for monitoring and measurement of water quality of domestic RWHSs	Some monitoring	No work done	work commenced on the new systems	Discussion is going on	Established system by 2025	2021 - 2030	
		No of household having RWHSs	About 50,000 (include 48,000 systems installed by LRWHF)	DNCWS - 648	DNCWS - 150	DNCWS - 386	Additional 20,000 - 10,000 by DNCWS		A total of 1184 RWH has installed, achieving 8% of the target by 2023
				LRWHF - 138	LRWHF - 132	LRWHF - 181	Additional 20,000 - 10,000 by LRWHF		A total of 451 RWH has installed, achieving 3% of the target by 2023
3.2	Device mechanisms to supply of safe drinking water during floods, droughts and during saltwater intrusion for all water supply schemes vulnerable to floods,	WASH Cluster coordinating mechanism, Infrastructure for emergency water supply during disasters (such as drought, saltwater inclusion and	Not fully operational Limited infrastructure and facilities, 28 (Internal Formal Audits) and 14		work in progress in routing work	Activated & functioning WASH Cluster Coordinating meeting. Completed 173 Internal Formal Audits and 53	Re activated and fully operational WASH Cluster coordinating mechanism by 2025 Target is to	2022 - 2030	

	droughts and saltwater intrusion.	floods) – Mobile treatment facilities, Bowers, water bottles, treated water units 3. Emergency response plans under Water Safety Plans by NWSDB 4. Institutional Disaster Management Plan	(External Formal Audits), Not commenced			External Formal Audits, Process of disaster management plan preparation started	be established, 208 (Internal Formal Audits) and 84 (External Formal Audits) by 2024 Adopted plan by 2024		
3.3	Strengthen interagency coordination for early warning on climate and weather-related disasters and health emergencies with timely disaster response	Effective inter-agency coordinating mechanism	Existing coordinating mechanism	On requirement meeting is schedule	On requirement meeting is schedule	On requirement meeting is schedule	Existing interagency coordination system strengthened	2021 - 2025	There is an effective coordination mechanism in place. Regular and special meetings are arranged when disasters occur to ensure timely response and interagency cooperation
3.4	Innovative approaches such as Payment for Ecosystem Services (PES) to be explored for catchment protection in vulnerable regions								
3.4.1	Develop innovative approaches for catchment protection in vulnerable regions	Number of innovative approaches/ tools introduced Number of projects implemented with innovative approaches	None			Planning stage of an approach	At least two innovative approaches/tools by 2024 The target number of projects to be established	2023 - 2030	Planning stage of Strengthening Climate Resilience of river basins, watershed areas and downstream of the Knuckles Mountain Range Catchment of Sri Lanka
3.5	Establish desalination or RWH facilities in most vulnerable areas with inadequate other sources of potable water	No of desalination plants completed against planned	Two (2) Desalination plants (Nainathivu & Delft– 1000 m3/day)	The maintenance of the existing desalination plants	Maintenance of existing desalination plants	Jaffna Desalination Plant established	Four (4) (Additional two desalination plants: Jaffna Tallaiadd by 2024i - 20,000 m3/day and	2021 - 2030	

							Kalpitiya – 10,000 m ³ /day by 2030)		
		No. of RWHSs installed	About 50,000	2601	1173	785	Additional 20,000 by 2030	2021 - 2030	A total of 3785 RWH has installed, achieving 19% of the target by 2023
3.6	Minimize the level of Non-revenue Water (NRW) as a water conservation / efficiency improvement measure in all water supply schemes.	NRW percentage	24.63%	25.82%	25.23%	25.32%	15.00%	2021 - 2030	Each Regional Support Centers of NWSDB has an allocation for Non-Revenue Water (NRW) under the Rehabilitation Budget. This NRW is an annual average percentage that varies based on leaks, bursts, and other issues occurring within that period. Metering or billing discrepancies may also impact this percentage
NDC 4 - Promote the use of wastewater for gardening, sanitary, construction and other purposes to reduce demand for treated water									
4.1	Some policy initiatives at the national level for use of treated water for other purposes piloting in industries, industrial parks and apartment buildings	Policy and legislative instruments and instructional setup: Amendments to the Act, National Policy on Sanitation National Level Integrated water resource management, (IWRM) policy Improved organizational setup for IWRM	Not commenced		2264/17 Amended - National Environmental Protection & Quality Regulation 2264/18 - The Prescribed Activities for which a license is Required	National environment act amendment - Draft level	Conductive Policy and legislative instruments and instructional setup in place Amended Act Approved National Policy on Sanitation Approved National Level IWRM policy	2022 - 2026	In 2022, an amendment to the National Environmental Protection & Quality Regulation and the Prescribed Activities for which a License is Required was completed. In 2023, a draft amendment to the National Environment Act was prepared. It is planned to include water reuse in the National Drinking Water Policy approval in 2024, and an amendment to the National Sanitation Policy will be made in 2025

							New organization al setup for IWRM		
4.2	Promotion of most appropriate mechanisms of water conservation / reusing / recycling for different purposes	1. Number of promotional programmes conducted per year 2. Different purposes having potential for water conservation / reusing / recycling 3. % of institutions having appropriate mechanisms 4. Quantity reused/ recycled	Baselines to be identified	No action taken	No action taken	Promotional programs to be conducted	1. To be established 2. To be identified by 2024 3. Target to be established 4. 13,300 m3/day of treated wastewater for Agriculture purposes in Jaffna district by 2030 and Reusing 20 m3/day of treated wastewater for Vehicle washing in Colombo District by 2025	2021 - 2030	In 2021 & 2022 could not conducted any programme with country situation, but in 2023 discussions were conducted on promotional programs.
4.2.1	Implement regulatory measures for water fittings	Number of appliance categories covered	Not commenced	Six Categories identified.	14 SLS standards for water fittings established.	11 SLS standards for domestic & building services valves reports are under review.	1. Six categories (Float-operated valves – metal, Float operated valves - PVC, all	2021 - 2024	14 SLS standards for water fittings published are coming under the float operated valves & sanitary products categories.

							valves – metal, all valves – PVC, ceramic commodes, cisterns) by 2024		
		Testing facility	Not commenced		Design contract awarded.	Hold the construction	Established Water fittings testing units at SLSI & testing of fittings		Designs and procurement process (up to Tender calling) complete. Temporally suspended due to financial issues.
4.2.2	Establishment of interagency coordination mechanism for Activity	Interagency coordination mechanism and organizational setup for water conservation/ reusing/ recycling	There was a water and sanitation platform, which could reactivate to implement this activity			National Steering Committee established and conducting meeting for implementation of regulatory measures for Water Fittings	Interagency coordination mechanism and organizational setup enacted by 2024 and operationalized	2023 - 2030	
4.3	Introduce by-laws and building codes to introduce reuse of wastewater in new industrial constructions including areas under industrial estates	Number of legal instruments (such as by laws and codes) enforced Number of final green building certifications issued	National Green Building Regulations (Blue Green SL) enforced by UDA (incorporating marks for wastewater reuse, buildings above 1,000 m2 – mandatory, industrial sector not covered at present)	13 Green Certified Projects	17 Green Certified Projects	22 Green Certified Projects	Targets to be established	2023 - 2025	A total of 52 Green certified projects has been completed by 2023

4.4	Introduce market mechanisms for promoting above.	Market mechanisms	In related policies (e.g. NEP), regulations (e.g. EPR) and action plans (e.g. NEAP), need for this has been identified			To be introduced	Market mechanisms established	2023 - 2025	During the discussion, it was decided to initiate discussions on introducing the market mechanism in 2025
4.5	Public awareness-raising on private and social benefits of wastewater management	No of public awareness programs on benefits of reusing wastewater developed and conducted per year	Some awareness programmes were conducted under projects implemented with the assistance of Development partners (NWSDB)	No work done	No work done	10 awareness programs	At least 10	2021 - 2030	10 awareness programs of wastewater management for school and hospitals were conducted in 2023
NDC 5 - Establish salinity barriers in 03 rivers where intakes are subjected to climate change influenced saline water intrusion during the drought season (covering Kelani Ganga, Kalu Ganga, and Malwathu Oya)									
5.1	Identify best solutions (covering technical and financial) for salinity barriers for each case	No of Salinity barriers having identified best solutions including water quality, quantity and water flow to identify the salinity intrusion	Three(Completed in 2020 - At Gin Ganga, Nilwala Ganga and Walawe Ganga)	Study of Ambathale salinity barrier is completed.			Five (Additional two at Ambathale and Kalu Ganga)	2021 - 2024	Kalu Salinity Barrier A pre-feasibility study done by TAHAL in 2014/ EIAs done LHI in 2018. EIAs study not approved. Kalu Salinity Barrier Authority constraints for the proposal.
		Number of Feasibility reports	Three feasibility Studies for salinity barriers at Gin Ganga, Nilwala Ganga, and Walawe Ganga were completed	Study of Ambathale salinity barrier is completed.	Designs of Ambathale salinity barrier is in progress.	Five (Additional two feasibility studies at Ambathale and Kalu Ganga)			

5.2	Establish salinity barriers at each critical river identified	Number of salinities barriers installed	Two (At Gin Ganga and Walawe Ganga)	Constructions of the Salinity Barrier at Nilwala Ganga is ongoing.		Ambathale salinity barrier design works are in progress.	Five (Additional three at Kalani Ganga - Ambathale, Kalu Ganga and Nilwala Ganga)	2021 - 2028	Funding support is received for the construction of Ambathale Salinity barrier through World Bank under CResMPA project.
5.3	Assess and establish regulatory mechanisms to manage ground water extraction in areas with salinity intrusion issue	No of sources been regulated by the established mechanisms	100	15	11	40	410	2021 - 2030	A total of 66 sources are regulated by WRB and, achieving 16% of the target by 2023
5.4	Monitoring and recording of saline water intrusion into drinking water sources especially during drought periods	Frequency of Water quality Monitoring	Daily reports	Daily reports	Daily reports	Daily reports	Daily reports	2021 - 2030	Real time water Quality monitoring report and NWSDB laboratory Water quality report, Water quality records on Salinity Intrusion in three river basins
5.5	Strengthening interagency coordination in early warning of salinity intrusion and allocation of water for flushing as a priority when needed	Interagency coordination framework Frequency of meetings	Present interagency coordination with limited river basin coverage, Weekly meetings			In Progress	Interagency coordination strengthened , Maintain the weekly meetings	2023 - 2030	
NDC 6 - Capacity building for water sector personnel and public awareness on building resilience to climate change									
6.1	Capacity needs assessment of the water sector institutions and the personnel on climate resilience building	Main capacity gaps on climate change impact facts that to be adapted to any situation identified number of participants, Number of Staff trained on Climate	Limited information on capacity gaps 20 (NWSDB)	No work done	No work done	Initiate Gap identification 2.0 One training programme conducted	Main capacity gaps on climate change impact facts that to be adapted to any situation identified by	2021 - 2030	

		Resilient Water Safety Planning (CRWSP)					2024, To be trained 1,350 officials		
		Number of Staff trained under DNCWS Training Plan	Baseline to be identified	201	265	263	468 Annually		A total of 726 staff have been trained under the DNCWS and, achieving 52% of the target by 2023
6.1.1	Include gender awareness and gender issues in climate change with specific reference to water sector in the above capacity needs assessment	Main capacity gaps for gender responsive planning and implementation identified and equal gender participation Number of training programmes on gender responsive CRWSP conducted, Number of Staff trained on gender-responsive CRWSP	Limited information on capacity gaps for gender responsive planning and implementation Baseline to be identified, Baseline to be identified		Draft assessment report	In Progress	Main capacity gaps for gender-responsive planning and implementation identified, Target to be established Target to be established	2022 - 2030	Currently, the ministry lacks the capacity to conduct these programs as it does not have any gender experts on staff. Additional resources and expertise are required to effectively implement gender-responsive training and planning.
6.2	Prepare plans for building capacity in each institution to effectively implement the sector NDCs including that of community water supply schemes	Monitoring and evaluation (M&E) system for capacity building initiative, Number of training programmes for effective implementation of the sector NDCs	Not in place None			No work done	Operational M&E, system by 2025 08 programmes (one per year) by NWSDB 60 annually by NWSDB	2023 - 2030	During the consultation process, it was identified that NWSDB had not been fully informed or aware of their specific targets in this area. Moving forward, NWSDB has acknowledged this gap and committed to implementing measures to address and prioritize these targets in their

		conducted, Number of Staff trained for effective implementation of the sector NDCs							future planning and operations.
6.2.1	Capacity building in drinking water - Community water supply sector	Number of capacities building programmes conducted	Baselines to be identified	4	2	11	40 programmes for officers	2021 - 2030	A total of 17 officers have been trained and, achieving 43% of the target by 2023
				75	30	68	500 for CBOs		A total of 173 CBOs staff have been trained and, achieving 35% of the target by 2023
		Number of participants/ trainees		4125	2980	2525	Target to be established		A total of 9630 have being trained by 2023
6.2.2	Capacity building in the RWH sector	Number of capacity building programmes conducted Number of participants/ trainees	Baselines to be identified	DNCWS -17 LRWHF - 2 programs - 66 members.	DNCWS -29 LRWHF - 6 Awareness programs - 290 participants	DNCWS -32 LRWHF - 3 official awareness program - 104 members	One per year, Eight in total (2 programs for government official on RWH in Badulla and Mullaitivu. 6 training programs for construction of RWHS conducted in Badulla, Monaragala, Mullaitivu, Mannar, and Anuradhapu ra by LRWHF). This is in addition to the five	2021 - 2030	A total of 378 Capacity programmes have been conducted by DNCWS by 2023. In 2021, LRWHF have conducted 2 Awareness programs in Northwestern province and Uva province. In 2022, LRWHF have conducted; 1 Awareness program - Northern province - 18 members / 2 official awareness programs - Badulla, and Mullaitivu districts - 176 members / 4 mason training programs - Mannar, Mullaitivu, Badulla and Anuradhapura districts - 96 youths. In 2023, LRWHF - 1 official awareness program - Mannar district - 48 members private sector awareness program - 48 members. Mason training program for South

							programmes conducted in 2021 and 2022.		Asian Country members - 8 members.
6.2.3.	Incorporate gender aspects in climate change adaptation in the domestic water use sector in the capacity building plans	Capacity building plans incorporating gender aspects in CC and water sector, Number of capacity building programmes incorporating gender aspects in CC and water sector conducted, Percentage of participation by gender	Not formulated, Five training programmes on CRWSP &SP conducted, Baseline to be identified	No work done	No work done	No work done	Capacity building plans formulated, Target to be established, Fair % of gender participation	2021 - 2030	Currently, the ministry lacks the capacity to conduct these programs as it does not have any gender experts on staff. Additional resources and expertise are required to effectively implement gender-responsive training and planning.
6.3	Awareness raising and behavioral change campaigns for the public towards sustainable use of water as a climate resilience building for water security	Number of awareness programmes conducted by NWSDB and DNCWS	28 by NWSDB, Awareness programmes conducted by DNCWS to be obtained	49	none	329	208 by NWSDB, Target for DNCWS to be obtained	2021 - 2030	A total of 329 awareness programs have been conducted by NWSDB by 2023. Social media campaigns, testimonial videos for behaviour change (BC), street dramas related to climate resilience impact, and public consultation meetings are planned to enhance public engagement. Financial assistance is needed to expand awareness programs, including providing necessary items for school awareness programs (such as refreshments, notebooks, and leaflets)

6.4	Capacity development in communities and Community Based Organizations (CBOs) in addressing climate resilience in water resources	Number of capacity development programmes conducted	Baselines to be identified	75	30	68	Target to be established	2021 - 2030	A total of 173 capacity building programmes have been conducted by 2023.
		Number of participants		4125	2980	2525	32,000 participants		A total of 9630 persons has been trained and, achieving 30% of the target by 2023
6.4.1	Incorporate gender issues into the capacity development programmes, allocate a share/a percentage for women participants in the programmes	Incorporation of gender aspects in Training modules Percentage of women participation	Not initiated			No. of training conducted with gender aspect - 23	Training modules have incorporated gender issues Target to be established	2023 - 2030	To develop a training module based on gender aspects, capacity building is required in this sector as there are currently no gender experts in the institute
6.5	Demand-side management and promotion of 3R amongst water users in most vulnerable areas for climate change	Number of promotional / awareness programmes conducted, Number of programmes for School children	None			Planned in 2025	Target to be established, 250 for School children	2023 - 2030	
6.6	Establish accreditation schemes for water sector technicians/plumbers with awareness on climate change vulnerabilities	Accreditation schemes	Accreditation scheme under development			Established 1 Accreditation scheme	Accreditation schemes established	2023 - 2030	Financial support for the Resource fee payment is required Sponsorships for trainers (School leavers/ low-income families) to follow the accredited programs & purchasing toolbox.
		Number of personnel accredited				743	50 annually by NWSDB		
NDC 7 - Restore, rehabilitate and augment 25 major /medium reservoirs and 300 minor irrigation systems and 200 km length of irrigation canals of Sri Lanka for enhancing climate resilience in the agriculture sector									
7.1	Prioritize abandoned tanks (including small tank cascade systems) and canals to be rehabilitated in the most critical areas of climate change	Prioritized List	None	Done			Prioritized List prepared	2021	Target achieved

	vulnerability paying attention to productivity gains in restoration								
7.2	Prepare indicative cost estimations, means of implementation with national capacity and international support needed for the priorities for restoration	Cost estimation of prioritized list	Cost estimation of a few major / medium tanks available	Done			Cost estimation of prioritized list completed	2021	Target achieved
7.3	Restoration/rehabilitation of 50 tanks and canals of 100km length	Prioritized minor tanks restored/ rehabilitated	Ongoing activity	400 tanks done			50 tanks out of prioritized minor tanks restored / rehabilitated	2021 - 2030	The target of 400 minor tanks - over achieved.
		Prioritized canals rehabilitated			20 km of canal length is completed	100 km out of 200 km of prioritized canals rehabilitated			
7.4	Augment capacity of irrigation tanks to enhance climate change resilience covering 25 major/medium reservoirs	Prioritized major/medium tanks augmented	Ongoing activity	2	2	No work done	25 tanks out of prioritized major/medium tanks augmented	2021 - 2030	departure of trained engineers from the engineering service has created a gap in technical expertise, highlighting the need for capacity-building efforts to train new personnel with the skills required to conduct these assessments effectively.

7.4.1	Construction of upstream reservoirs for drinking water	Number of tanks constructed	2	Basnagoda Reservoir construction ongoing. Feasibility studies on Yatimahana reservoir ongoing. Pre-feasibility study on Pali Aru Reservoir ongoing. Nawayalawila Reservoir: Initial request made to implemented through the ID	Basnagoda Reservoir construction ongoing. EIAs study for Proposed Yatimahana Reservoir is ongoing Pre-feasibility study on Pali Aru Reservoir ongoing. Nawayalawila Reservoir: Hydraulic study conduct by ID	Basnagoda Reservoir construction ongoing. Yatimahana Reservoir: Final EIAs report and Public hearing is completed. Addressing the comments received at Final TEC. Pre-feasibility study on Pali Aru Reservoir ongoing. Nawayalawila Reservoir: Obtained Environment Clearance	4	2021 - 2030	Yatimahana Reservoir NPD, Cabinet approvals already obtained. Financial support need for construction. (LKR 20.3 BN (Based on 2017 rates)) Pali Aru Reservoir Land Consent is pending. Financial support needed for construction. (LKR 116 Bn (Based on 2023 rates)) Nawayalawila Reservoir Tentative TEC : Rs. 1500 Mn. Financial assistance required for initial studies (18% of TEC)
NDC 8 - Introduce or promote alternative water resources as a climate change resilience building intervention for domestic and supplementary irrigation									
8.1	Carryout feasibility studies for use of alternative sources of water for irrigation and ground water recharge for building climate resilience	Feasibility studies conducted	0	No work done	One feasibility study commenced		One feasibility study conducted as a pilot	2021 - 2025	
8.1.2	Update the draft gender assessment and analysis for the Irrigation sector to identify main gender issues in the sector relevant for adaptation	Assessment	None			No work done	Main gender issues in the irrigation sector documented and shared amongst	2023 - 2024	Currently, the ministry is employed with technical experts and lacks capacity in this area. Even with external assistance to conduct these assessments, internal capacity is not related

	with external assistance						sector institutions		
8.1.3	Build awareness and capacities of the main planning and implementation agencies in irrigation sector on gender issues related to climate change and access and use of irrigation water	Number of Awareness building programmes conducted on gender issues in climate adaptation at the planning and decision-making level Number of agencies covered per year	None so far			No work done	10 (One Programme per year covering all relevant agencies)	2023 - 2030	
8.2	Assess and identify priority domestic water supply and supplementary irrigation schemes to be supported by groundwater resources (tube wells, deep wells) as part of climate change resilience-building efforts.	Prioritized list	None	109 Ground water recharge systems	66 Ground water recharge systems	111 Ground water recharge systems	Prioritized list completed	2021 - 2023	A total of 286 of Ground water resources has been recharge with the RWH systems.
8.3	Regulate provision of groundwater through Agro wells for irrigation based on water availability and safe abstraction levels (2030).	Level of enforcement of the Regulations	Regulation in place	14	4	4	Target need to be set	2021 - 2030	Commercial scale tube well drilling for Agriculture is in regulation. In addition, awareness and approval process has been in progress at District level for above 4 m of di. Agro wells (at commercial scale) as per the Gazette Notification 2017. At present DSD level, the approval process has initiated. Department of Agrarian Development permitted to construct as per the given guideline by Department of Agrarian Development.

8.3.1	Include gender expertise in the PMUs and Planning teams	Percentage of PMUs and planning teams equipped with gender expertise, as reflected by the gender analysis related to the projects implemented	None				NWSDB has conducted initial discussions	All PUMs and Planning teams by 2030	2023 - 2030		
NDC 9 - Enhance water management in 40 irrigation schemes											
9.1	Increase system water use efficiency in irrigation schemes by 10% to cover at least 45,000 ha of irrigated land	Number of schemes and extent covered	Current water duty (Acre feet per acre) of different schemers ranging from 4 – 7 feet (Average 5.5 feet)	Work commenced	Work continues	Work continues	30 schemes in ID Balance 10 schemes in MASL		2021 - 2030	Irrigation Department- 01 completed and 01 in progress MASL -10 in progress	Budgetary constraints prevented the achievement of the intended targets. Additionally, the departure of trained engineers from the engineering service has created a gap in technical expertise, highlighting the need for capacity-building efforts to train new personnel with the skills required to conduct these assessments effectively. It is highly recommende
9.2	Introduce water-saving applications like micro- irrigation system (sprinkles) and low water intensive crops	Number of micro irrigation systems introduced, Number of types of crops introduced	None	7(50%)	10 (75%)	12 (90%)	14 by 2025		2021 - 2025	90% of the target has been completed by 2023	
9.3	Farmer training and awareness on water saving applications	Number of Programmes conducted, % of programmes attendance of women farmers participated	Ongoing activity	On going	On going	On going	Not less than 40 programs per year, Not less than 10% of programs from the above, where attendance of women farmers participated		2021 - 2030	This is an ongoing process, and upon the completion of each project, farmer training programs are conducted before the project is handed over	

										d to expedite the recruitment of engineers for the engineering service.
9.4	Introduce efficient distribution of water among farmer organizations through better water allocation mechanisms	Pilot study	Not commence			Small scale studies have being done	Completed pilot study by 2025	2023 - 2025	Under Climate Smart Irrigated Agriculture Project (CSIAP) small scale studies has conducted	
9.5	Promote market-based instruments for the adoption of new irrigation technologies (water Subsidy schemes and tax reliefs)	Number of pilot studies	None			No work done	Target to be set	2023 - 2030		
NDC 10 - Assess river floods and mitigation measures and early warning systems for possible flash floods for five priority basins (2030) (covering Kelani Ganga, Attanagalu Oya, Kalu Ganga, Kirindi Oya and Malwathu Oya on pilot basis)										
10.1	Install rivers and reservoir gauges and collect rainfall data and river flow data for the five priority basins	Basins covered with adequate hydro meteorological data network	16 stations in all 5 basins covered with hydro meteorological data network	World Bank Project (CResMPA) preparatory work initiated		In progress	All 5 basins covered with enhanced hydro meteorological data network	2021 - 2030		Due to the departure of trained engineers from the engineering service has created a gap in technical expertise, highlighting the need for capacity-

10.2	Prepare digital elevation maps / models for all priority basins and establish automated early warning systems	Digital elevation models (DEMs) for priority river basins Early warning systems for priority river basins	Digital elevation models (DEMs) are available for the Kalani and Attanagalu basins. Manual early warning systems are in place for all 5 priority river basins.			Initial works commenced (CResMPA)	Digital elevation models (DEMs) for flood prone areas for 3 priority basins prepared Early warning systems for 5 priority river basins upgraded	2023 - 2025		building efforts to train new personnel with the skills required to conduct these assessments effectively. It is highly recommended to expedite the recruitment of engineers for the engineering service.
10.3	Conduct capacity building programs for newly established early warning systems associated technological applications and dissemination	Number of capacity building programs conducted Sex-disaggregated data on capacity building program participants, showing the percentage of women involved.	Average level of competency of relevant staff for the existing systems			To be commenced from 2025	Capacity building of all relevant agencies	2023 - 2025	Capacity building can begin once some progress has been made in section 10.2	
10.3.1	Reach out to communities effectively using mobile Applications on river flooding.	Mobile app % of women targeted/included in introducing the app	Not available, App is yet to be introduced			Mobile App and ID Web portal are already available, Early warning disseminates commonly	App introduced, Not less than 50% of women reached with the app	2023 - 2025	Capacity building is crucial to improve technical capabilities, enabling systems to handle high user volumes in emergencies. (gender data filtering for 5 million users, ensuring inclusivity,	

									efficiency, and equity)	
10.4	Introduce flood mitigation structures to handle climate change influence risks	Flood mitigation structures	Existing structures in 2 river basins (Kalani, Kalu)	No work done	work commenced	Continuation of studies of gin ganga and Nilwala Ganga	Existing structures were enhanced, and two new ones introduced: Ambathale salinity barrier and Wee Oya reservoir.	2021 - 2030		

Annex 26: Progress made in implementing and achieving the NDCs in Biodiversity sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii-iii)}			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)(paras. 69-70 of the MPGs)
				2021	2022	2023			
NDC 1 – Management of climate sensitive areas and restoration of degraded areas inside and outside the protected areas(PAs) networks to conserve habitats that are highly vulnerable to climate change									
1.1	Identify habitats using existing maps that are most vulnerable to climate change-driven changes and adaptive measures taken in response to climate change to inform priority sites that need to be restored or rehabilitated both within and outside PAs	No of Habitats identified which are vulnerable to climate change, No of habitats thus identified in which appropriate adaptive measures taken Number of existing PAs and ESAs	105 PAs under DWC 875 PAs under the FD 10 EPAs under the CEA 14 Special Management Areas under CC&CMD 5 Environment Sensitive Areas 3 NWPEA (these have been declared	3 Sanctuaries 01 MER DWC	No progress	No progress	Identification of habitats which are most vulnerable to climate change in the entire country, Appropriate adaptation measures taken to increase their resilience, At least 500 (PAs and ESAs) identified/	2023-2030	Initiated in 2023. Identify habitats using existing maps that are most vulnerable to climate change-driven changes were not available with BDS/CCS or FD, DWC and CEA However, FD, DWC and CEA have taken measures to establish PAs according to their legal mandate and priorities. Third National Report provided maps for different Sectors but not for the Biodiversity sector
				106 Forest Reserves FD	03 Forest Reserves FD	No progress			
				01 EPA CEA	No progress	01 EPA CEA			

			based on their Ecological importance not climate vulnerability)	ESA Maps preparation in progress	ESA identification in progress. Maps preparation in progress	Identified 193 ESA based on Faunal assessment. Floral assessment ongoing. Maps were not available. ESA Maps preparation in progress	declared/ gazette/co-managed		vulnerable maps so that DWC, FD, and CEA can make use of them. ESA maps preparation is in progress. Request Climate Vulnerability maps from Climate Change Secretariat
1.2	Prepare maps indicating terrestrial wetland landscapes, coastal and marine areas such as mangroves, seagrass beds, fog-interception area, villus, etc. that should be the focus of priority actions identified above in order to enhance their resilience	No. of Maps prepared	Maps on mangroves and other PAs are available, Maps are prepared by the DWC and FS which indicates areas that contain IAS, degraded habitats, and mangrove degraded areas) ESA maps are not available. Base line – 89 forests (18,959.72 ha)	FD has identified 1646 ha. But need to include all the identified vulnerable ecosystems	FD has identified 235 ha. Need to include all the identified vulnerable ecosystems	No new areas. Maintenance only	500 maps prepared to include all the identified vulnerable ecosystems	2023-2030	Work initiated in 2023. Maps preparations are in progress. MoE, DWC and FD identified degraded areas to be rehabilitated. FD 1646 ha in 2021 and 435 ha in 2022. (During 2023 Maintenance only). Item No. 1.2 Carried out a drone survey and prepared detail maps for following Environmental Protection Areas (EPA) i. Muthurajawela EPA (2023) ii. Warathanna Hakkinda EPA (2023) iii. Walawwewaththa Wathurana EPA (2023) iv. Thalangama EPA (2022) v. Pansalathanna – Maussawa EPA (2023) Total budget allocation: 5,000,000.00

1.3	Identification of species of fauna and flora that are highly vulnerable to climate change	Updated list of species vulnerable to climate change identified through scientific methods.	Existing National Red List	6th National Review 2019, Red List on Plant 2020, , Red List of Freshwater Fish 2020, Red List on Birds 2021	Red List of Mammals, Herpetofauna, Butterfly and Dragonfly in progress		Comprehensive list of fauna and flora which are affected by climate change prepared	2021-2030	Work initiated in 2023. Comprehensive list of Fauna and flora Prepared with Threaten Categories, but not on climate vulnerable aspects.
1.4	Encourage research and studies on most vulnerable species and habitats identified in 1.1 and 1.3	Number of scientific communications, research projects	Research work scattered on these aspects i.e. 3 projects- DNBG +2 recovery plans DNBG and also by academia but not collated under the umbrella of climate change	DWC Research symposium, University and other Institutes' Research symposiums, Individual Publications in Journals	Universities, Research Institutes (NARA), NGOs, Individual Researchers. Research work yet to collate	Universities, Research Institutes (NARA), NGOs, Individual Researchers. Research work yet to collate	Long term Research projects done in the identified vulnerable ecosystems	2023-2030	Work initiated and in progress. Long term research projects are done in different PAs and climatic zone by NGOs, Universities and Individuals. But not collate under the umbrella of climate change.
1.5	Establish long-term monitoring plots and mechanisms in climate sensitive areas to identify climate change driven changes in species and habitats	Number of monitoring plans for climate vulnerable species, Number of long-term monitoring plots with appropriate mechanisms	Sinharaja, Pitakele, Walankanda Endana Estate, 4500 plots demarcated by FD -need to identify climate risks for future research, Hambantota NBG- Mirijjawila Research station regeneration plot	No progress	No progress	To commence in 2023 after vulnerable areas had been identified.	Long-term monitoring plots with appropriate mechanisms are established to cover all the climate zones in the country	2021-2030	Universities, NGOs and other institutes are involved in Research. But need to coordinate them under BDS/CCS, DWC, FD Research divisions, NSF and National Research Council (NRC).

1.6	Restoration of at least 25% each of degraded terrestrial and wetland landscapes including coastal & marine habitats identified above (1.2) and based on current extent and prioritized according to biodiversity value, ecosystem values and climate change vulnerability	% of restored extent	This will be stated after completion of 1.1 and 1.2. However DWC and FD have made progress in line with degraded lands	<p>DWC 2021- Thabbowa-200 ha Wasgamuwa- 114 ha Bundala-30ha Minneriya- 150 ha FD 2021- Thabbowa-200 ha Wasgamuwa- 114 ha Bundala-30ha Minneriya- 150 ha. Assisted Natural Regenerations (ANR) 540.16</p> <p>FD -Forest Restoration- 110.5 ha Mangrove Restoration 44.ha.</p>	<p>2022- Prosopis- Bundala - 130ha Eupatorium, Lantana- Udawalawa- 40 ha Prosopis- Thabbowa- 30ha</p> <p>Mangrove Restoration by the DWC – 45 ha at Anawilundawa Sanctuary (RAMSAR site)</p> <p>Ulex was removed in Horton plains (within 2 years-19.5 ha. 60.99). FD.2022 Assisted Natural Regenerations (ANR) 60.99 Forest Department Mangrove restoration 2022 5.00ha</p>	Forest Department NAR 32.7ha	At least 25% of the identified extents from 1.1 and 1.2	2021-2030	<p>Restorations are in progress but not in line with climate change vulnerability maps.</p> <p>2021- Thabbowa-200 ha Wasgamuwa- 114 ha Bundala-30 ha Minneriya- 150 ha</p> <p>2022- Prosopis- Bundala -130 ha Eupatorium, Lantana- Udawalawa- 40 ha Prosopis- Thabbowa- 30 ha</p> <p>Mangrove Restoration by the DWC – 45 ha at Anawilundawa Sanctuary (RAMSAR site)</p> <p>Ulex was removed in Horton plains (within 2 years-19.5 ha</p> <p>Manawa kanda IAS Removal Program In 2023 by MoE (Rs.400'000.00)</p> <p>IAS removal program on Horton Plains NP on May 2024 (Rs.800'000.00). Item No. 1.6 Removal of invasive alien species was carried out in boundaries of Walawwewaththa Wathurana Environmental</p>
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									Protection Area (Swamp Forest) - 2023
1.7	Restore the natural ecosystem in fog interception zones at least by 25%	% of restored extent	This will be stated after completion of identification of degraded fog intercepted landscapes (ESA maps-ongoing, vulnerability maps) Ulex removed from 19.5 ha	Ulex was removed in Horton plains (within 2 years-19.5 ha)	2022 Restoration (FD) 832.5 ha Forest Department Mangrove restoration 5 ha	2023 Restoration (FD) 430.5. Forest Department Mangrove restoration 5 ha	At least 25% of the identified extents from 1.1 and 1.2	2021-2030	Ulex sp (IAS) was removed in Horton plains (within 2 years-19.5 ha)
NDC 2 - Increase connectivity in the zones that will be subjected to climate driven changes according to current predictions through landscape approaches									
2.1	Conduct a feasibility assessment (based on 1.2 above) to identify connectivity corridors on a landscape/Seascape level using the river basins located in the climate sensitive areas	Feasibility assessments of landscape and seascape	Feasibility studies on corridors had been done but not exclusively taking climate vulnerability into account	Corridors have been identified. But not based on 1.2. Leopard Corridors, Elephant corridors 16 in different locations	MER Hambanthota	Leopard corridors in Central highlands	Feasibility assessments conducted on all the identified vulnerable ecosystems in 1.2	2023-2024	Work initiated and in progress 16 corridors have been identified considering elephant as the flagship species. However, river basins were not necessarily considered as a criterion. Not on seascape level and 1.2. Under GEF vii project kotagala Albedda, Hapugasthenna, Rassagala-connectivity corridors proposed to connect with PAs

2.2	Restore climate-vulnerable riparian and instream areas that can act as corridors based on the above feasibility study covering at least 25% of identified	% of restored extent	0 (Will be done after the completion of 2.1). Restoration by DWC for North of Wilpattu Mollikulam at Kal Aru and Hungamala Elephant Corridor				At least 25% of the identified areas restored	2025-2030	Will commence in 2025
2.3	Monitor such corridors for their efficacy to serve as biodiversity corridors and making adaptive changes to enhance movement	Monitoring of identified corridors. Also, the species and numbers of fauna which uses the corridors	Nil				All identified corridors are continuously monitored	2025-2030	Will commence in 2025. Under GEF 7 project planned to established corridors and enhance the movements by BDS
NDC 3 - Expansion of Protected Area (PA) extent to enhance the ability of the PA network to function as a buffer for climate change									
3.1	Identify ecologically/ environmentally sensitive areas (based on 1.2) within the climate sensitive areas that can be annexed (included) to existing PAs	The extent of areas identified to be included in the existing PA network	5 ESAs identified already including 18,000 ha of mangroves	progressing	progressing	progressing	All areas thus identified will be made PAs	2025-2028	Commence 2025. However, Identification of Boundaries of Mirissa Sanctuary (152,870.36 ha), Talawila Sanctuary (7,970 ha), Sambalative Sanctuary (239.58 ha), Narangala Sanctuary (239.2 ha), Warnagala Watta completed.
3.2	Identified areas to existing PAs / to be declared as new PAs under mandated agencies	Gazette notification of the declared sites					All Identified areas declared. The number cannot be stated here as this will be done based	2025-2030	Commence 2025. Declaration of Mirissa Sanctuary (152,870.36 ha), Talawila Sanctuary (7,970 ha), Sambalative Sanctuary (239.58 ha), Narangala ,

							on the need. There would not be large ones on land but those adjoining the Mirissa, Thalawila Sanctuaries will be declared in the future by DWC		Warnagala Watta (close to Samanala Nature Reserve) Sanctuary (239.2 ha) under the. Provisions of FFPO are ongoing.
NDC 4 - Strengthen ex-situ conservation programmes covering climate vulnerable taxa and regions									
4.1	At least two facilities to be established for ex-situ conservation of flora in the climate vulnerable region (botanical gardens and arboreta) within 5 years	Botanical gardens established	6 facilities in Peradeniya, Hakgala, Gampaha, Awissawela, Hambanthota, Ganewaththa.	Plan for 2025	Plan for 2025	Plan for 2025	2 facilities ex-situ conservation for flora established (montane intermediate)	2025	To commence in 2025. Currently no such facility exists
4.2	At least two facilities to be established for ex-situ conservation of fauna in the climate vulnerable regions (ex-situ conservation centres) within 5 years	Ex-situ facilities	3 (Safari Parks -Ridiyagama, Gonapala Farm, Dehiwala, Pinnawala Conservation Centre)	To commence in 2024. Currently no such facility exists			2 ex situ facilities established (montane intermediate)	2025-2026	To commence in 2025.
4.3	Establishing a mechanism to assist translocation/reintroduction of climate sensitive or	Mechanism to assist translocation/reintroduction of climate sensitive or threatened fauna and flora	<i>Alphonsea hortensis</i> reintroduced to suitable habitats under FD Threatened/near	Commenced in 2023. Moragahakanda relocation programmes being	Botanical gardens propagate threatened plants. Assisted	Elephant relocation programme	Mechanism established	2023-2027	Work commenced in 2023 Funding is necessary to monitor these programmes. Elephant relocation programme

	threatened fauna and flora		extinction species are being reintroduced by the FD. Done in Moragahakanda Project by DWC	conducted by the DWC. Only relocation prog done by DWC. Elephant relocation programme	migrations/ colonization.				
4.4	Introduction of 3 new number of Veterinary/ Epidemiology facilities for Ex-situ Conservation Canters	3 facilities introduced	Giritale, Hiyare Rescue centre, DWC (Bellanwila) 3 zoos have new hospitals	DAPH and VRI are engaged in epidemiological research although there are no dedicated centres			3 facilities introduced	2023-2030	DAPH and VRI are engaged in epidemiological research although there are no dedicated centres
4.5	Develop Gene Banks in National Zoological Gardens (NZGs) and National Botanical Gardens (NBGs) and Plant Genetic Resources Centre (PGRC)	Gene banks (Flora and fauna). Number of accessions. Number of species, sub-species	DNA Bank Initiated - Herbarium, PGRC	Will commence in 2028.	Will commence in 2028.	Will commence in 2028.	Gene banks in NZGs and NBGs and Plant Genetic Resources Centre (PGRC) developed / upgraded	2028-2030	PGRC conserves only crops. Therefore, it would be good to establish a gene bank at NBG
NDC -5 - Effective management of spread of Invasive Alien Species (IAS) triggered by favourable climatic conditions									
5.1	Conduct a desk assessment based on the available distribution maps of IAS to identify IAS that are likely to undergo range expansion or whose range expansion can be facilitated by climate change and	Assessment report	Distribution maps available with BDS	Maps not available with BDS	No progress	Work in progress 2023. Maps not available with BDS	Desk assessment completed	2023-2024	Work is not completed within the targeted time

	anthropogenic activities								
5.2	Implement programs in critical areas as identified in 5.1 to enhance the resilience of ecological & economical systems towards possible biological invasions triggered by climate change	Number of programmes conducted	0 (Nil)	Maps are available. But not in line with Climate change. Wilpattu, Udawalawa, Horton Plains, Bundala	Wilpattu, Udawalawa, Horton Plains, Bundala	Wilpattu, Udawalawa, Horton Plains, Bundala	Programmes conducted in all (as defined by 5.1) critical areas	2024-2030	Programmes conducted but not in line with 5.1 (as defined by 5.1) critical areas.

Annex 27: Progress made in implementing and achieving the NDCs in Coastal sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)
				2021	2022	2023			
NDC 1 - Establish an accurate sea level rise forecasting system for Sri Lanka									
1.1.	Establish the required database with historical tidal level data	Number of years for which the database is established	No national level database in operation (However there were data in scattered form with different agencies)	Works commenced	Work progressing in the continuation of the updating of the database	Historical database established and continue the database updating	Tidal Database with historical tidal level data up to year 2022 to be published by 2023 and update yearly	2021-2030	NARA has established a historical tidal records database, which includes data collected from permanent sea-level monitoring stations located at key coastal sites: Point Pedro, Trincomalee, Colombo, Mirissa, and Kirinda. Data collection is ongoing to further enhance this database.
1.2.1.	Measure and record present Mean Sea Level (MSL)	% number of locations where the present MSL is measured and recorded	0% (However, earlier version of the MSL is available)	Work regards the revision of the MSL in progress	Work regards the revision of the MSL in progress	Work regards the revision of the MSL in progress	100% (All the locations with revised MSL)	2021-2023	The revision of the Mean Sea Level (MSL) is currently in progress and is being conducted in collaboration with other agencies.
1.2.2	Assess and publish sea level rise) measurements	% number of locations where the present MSL is accessed and published	0% (However, earlier versions of sea level rise records and maps are available)	-	-	-	100% (All the - locations with revised sea level rise	2024-2030	The work is scheduled to commence in 2024
1.3.	Establish additional sea level measurement stations in identified	Number of additional /backup	Present stations (07)	No work done specific	No work done	Location identified, but no work done	Three new automated stations with	2021-2025	Established a new sea level monitoring station at Point Pedro 2023.

	locations, to cover the coastline of Sri Lanka in addition to the existing stations	tidal measurement stations		to this activity	specific to this activity	specific to this activity due to financial issue	backups and 07 backups for all existing stations		Proposed locations: Dondra, Mannar, Potuvill, Wennappuwa, Hambanthota. Financial constraints
1.4.	Estimate sea level rise predictions for Sri Lanka using global best practices	Number of locations for which the sea level rise is estimated	Since 2016, sea level rise has been estimated by NARA which continues to date	-	-	No work done specific to this activity	10	2023-2026	NARA has quantified the sea level trend and its acceleration, identifying a positive trend of 3.8 mm per year. This finding aligns with and validates satellite-based observations. Financial constraint
NDC 2 - Prepare updated vulnerability and risk maps for the coastal belt of Sri Lanka									
2.1.	Update inundation maps covering coastal area according to the sea level rise forecast Based on 1.1	% of the coastline covered by the inundation maps	0	-	-	No work done specific to this activity	1	2023-2025	No specific work has been carried out for this activity.
2.2.	Identification of areas vulnerable to sea level rise	Number of DS divisions covered	None	Information procurement to update the existing maps	More information procurement to update the existing maps	No work done specific to this activity	All 74 DS divisions	2021-2024	No specific work has been carried out for this activity.
2.2.1.	Identify locations where vulnerable communities are present and take action to reduce them	Number of locations by GN divisions, % of relocations of families who are vulnerable	Baselines to be obtained	No work done specific to this activity	No work done specific to this activity	No work done specific to this activity	Targets to be established	2021-2025	No specific work has been carried out for this activity.
2.2.2.	Prevent the establishment of new settlements in vulnerable areas	Regulation to prevent new settlements, Number of interventions conducted to prevent new settlements	No regulation in place, No interventions	-	-	No work done specific to this activity	Enacted regulation to prevent new settlements, Target to be established	2023-2025	No specific work has been carried out for this activity.
2.3.	Prepare sea level rise influenced risk maps	% area covered by risk maps	Some hazard maps	-	-	-	1	2025-2027	The work is scheduled to commence in 2025

	for the coastal zone with 0.5m contour intervals and take appropriate actions		available, but not validated						
2.3.1	Prepare vulnerability databases for the coastal zone with 0.5m contour intervals.	% coastal zones covered by vulnerability databases	No database, some information/ data available on vulnerability	-	-	-	100% (Databases cover the entire coastal zone)	2024-2025	The work is scheduled to commence in 2024
2.3.2.	Establish Digital Elevation Model (DEM) for the entire coastal zone	% coastal zones covered by DEM	0% (No DEM)	-	-	-	100% (DEM covers the entire coastal zone)	2024-2025	The work is scheduled to commence in 2024
2.4	Use findings in 2.3 to update the existing coastal development setbacks	% of updated setbacks defined incorporating sea level rise in the Coastal Zone Management Plan (CZMP)	0% (Updated setbacks yet to be incorporated in the CZMP)	-	-	-	100% (All setbacks are updated incorporating sea level rise covering the entire coastal zone)	2026	The work is scheduled to commence in 2026
NDC3 - Adopt optimal shoreline management works/measures covering affected length of shoreline using a combination of hard & soft solutions to prevent coastal erosion in areas most vulnerable to sea level rise									
3.1.	Long term data collection programmes, including wave measurements and a sediment transport study	Number of programmes/studies	Not commenced	-	No work done specific to this activity	No work done specific to this activity	Wave measurements and a sediment transport study completed	2022-2026	No specific work has been carried out for this activity.
3.2.	Update the Erosion Management Plan	Erosion Management Plan updated	Existing Erosion Management Plan - 1986	Data collection in progress	Further data collection in progress	Further data collection in progress	Updated erosion management plan	2021-2026	Work is in progress with data collection.

3.4.	Restoration of coastal ecosystems including mangroves covering 1,000ha. (This action linked to action 1.6 of the Biodiversity Sector NDC 1	No of hectares of coastal ecosystems restored	100 ha	Work in Progress	Work in Progress	1,000 ha of mangroves restored in Puttalam, Trincomalee, Ampara, Batticaloa and Mulative districts	1,000 ha of mangrove coverage	2021-2030	To achieved the target, restoration of 1,000 hectares of mangroves across the Puttalam, Trincomalee, Ampara, Batticaloa, and Mullaitivu districts.
NDC 4 - Identify and declare coastal and marine natural areas of high priority for building resilience for climate change impacts									
4.1.	Prepare appropriate criteria and list of candidate sites to be declared as high priority natural areas	Number of candidate sites declared	Two sites (Established before 2020)	10 sites under study	10 sites under further study	38 sites identified and listed in CZMP 2024-2029	Additional ten (10) sites	2021-2025	A total of 38 sites have been identified and included in the Coastal Zone Management Plan (CZMP) for the period 2024-2029.
4.2	Declare and manage high priority natural areas as required through gazette notifications	No of new sites gazetted, Number of new management plans prepared	Activity not commenced	No new sites gazette, No new management plan prepared	No new sites gazette, No new management plan prepared	One site will be declared by Department of Forest with CC&CRMD	Targets to be established	2021-2028	One site is set to be declared by the Department of Forest in collaboration with the CC&CRMD.

Annex 28: Progress made in implementing and achieving the NDCs in Health sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)
				2021	2022	2023			
NDC 1 - Policy initiatives for enhancing climate resilience of the health sector promoted and integrated to all related sectors									
1.1	Development and implementation of the Heat – Health Action Plan (HHAP) for Sri Lanka	HHAP	Draft HHAP in place	–	5%	20%	Heat Health Action Plan finalized by 2023 and implemented	2021 - 2030	Stakeholder consultations held in 2023. Revision is ongoing. Some activities such as early warning is being implemented
1.2	Development and implementation of the National Strategic Plan for Health, Environment and Climate Change (NHSPEC)	NHSPEC	None	–	–	20%	NHSPEC developed and implemented	2023 - 2030	Stakeholder consultations held in 2023. Funding sources have been identified for the development process
1.3	Development and implementation of guidelines and standards to make Green and Healthy (G&H) Hospitals	Guidelines and standards, % of certified Green & Healthy hospitals	Not commenced	–	5%	20%	Guideline development 100%, At least 5% (Ten hospitals)	2021 - 2030	Development process started on 2023. Stakeholder consultations held in 2023

1.4	Health action plan prepared to reduce the disease burden due to air pollution and implementation commenced	Health Action Plan for reduction of disease burden due to air pollution Surveillance system to monitor disease burden due to air pollution	Not commenced	–	–	10%	Health action plan prepared to reduce the disease burden due to air pollution developed and implemented Operational Surveillance system to monitor disease burden due to air pollution	2023 - 2030	Desk review and stakeholder consultations held in 2023. Development in progress
NDC 2 - Improved capacity to manage Non-communicable Diseases (NCD) and health conditions directly attributable to climate change									
2.1	Identify diseases and health conditions expected to aggravate due to climate change	Coverage of the assessment of diseases & health conditions expected to aggravate due to climate change	None	–	–	60%	Diseases & health conditions expected to aggravate due to climate change identified and recorded	2023 - 2024	Diseases identified in 2023
2.2	Develop management guidelines for the prioritized diseases and health conditions including clinical and preventive guidelines	The guidelines	Some in place	–	5%	15%	Guidelines for the prioritized diseases and health conditions including clinical and preventive guidelines developed by 2025	2022 - 2025	Certain guidelines in place. To be revised in 2025
2.3	Capacity building of health system in addressing climate change influenced diseases and health conditions.	Number of programs held, No of staff trained	None	–	–	30%	Five programs per annum 250 health workers trained per annum	2023 - 2030	Capacity development plan and presentations developed in 2023. Carcinogen atlas prepared.
2.4	Identify potential at-risk categories/vulnerable groups (elderly, children, vulnerable worker groups and any other vulnerable categories) and to develop a road map in managing climate change induced non-communicable diseases (NCDs)	Roadmap in managing climate change induced NCDs for different vulnerable groups	Vulnerable communities identified but not specifically related to climate change	–	–	10%	Finalized roadmap by 2026	2023 - 2026	Carcinogen atlas developed as a base document in 2023

2.5	Strengthen research capacity on generating evidence on climate change and health impacts	Research agenda developed 2. Number of research activities conducted & published	Research agenda development not commenced Number of the existing research reports on the topic is to be identified	-	-	10%	Research agenda published At least one research completed per annum	2021 - 2030	A meeting was held to discuss about the research agenda
NDC 3 - Manage worsening of nutrition related health impacts due to climate change									
3.1.1	Provide nutrition status data to relevant agencies to develop surveillance system for food and nutrition security in Sri Lanka	Nutrition status data provided	Limited information on nutrition status	-	-	10%	Comprehensive nutrition status data is collected and communicated by 2024	2023 - 2025	Vulnerable communities identified. Activity on going
3.2.1	Develop and implement programs to improve nutrition among vulnerable groups (differently abled persons, elderly etc.)	Programs to improve nutrition among vulnerable groups	No specific programs developed	-	-	20%	Programs to improve nutrition among vulnerable groups developed and implemented till 2030	2023 - 2030	Developed foster care scheme for severe acute malnourished children belonging to economically vulnerable families. IEC material developed in 2023
3.3	Strengthen public health system to intervene early in climate related nutrition issues	Integration of climate related nutrition aspects in public health system	The issues identified and interventions initiated			20%	Climate related nutrition issues identified and addressed. (Under 5 malnutrition, micronutrient deficiency) by 2026	2021 - 2026	Five-day residential programme on Training of Trainers conducted in Nuwara Eliya. Emergency Nutrition Action Plans for five districts developed
NDC 4 - Strengthen surveillance and management of climate sensitive vector and rodent borne diseases (Dengue, Malaria, Filariasis, Leishmaniasis and Leptospirosis)									
4.1	Strengthen disease surveillance system for climate sensitive vector borne diseases	Climate sensitive vector borne surveillance system	A surveillance system for Dengue, Malaria, Filariasis, and Leishmaniasis in place	-	20%	50%	Well-functioning vector borne surveillance system by 2026	2021 - 2026	National Dengue surveillance system (NaDSYS) was upgraded from sentinel DENSYS system to comprehensive NaDSYS in 2023,

									E surveillance to capture leptospirosis data and 3 TOTs conducted for ICNOs (Infection Control Nursing Officers)
4.2	Develop early warning systems at MOH level based on rainfall/temperature forecast for each climate sensitive vector borne disease	% coverage of MOH level improved early warning system for vector borne diseases	20%	–	20%	40%	100%	2021-2024	Early warning system incorporating climate, spatial and epi data available at the national and district level mainly for dengue
4.3	Capacity building of the public health system, local authorities and other stakeholders in prevention of occurrence of outbreaks and to rapidly respond to early warnings through effective interventions in prevention and control infectious diseases	Number of capacity building programs, Number and sectors trained, Training manuals	A few programs are conducted yearly, Number and sectors trained to be identified, Training manuals yet to be published	–	100%	100%	Every year till 2030	2021 - 2030	32 ToTs conducted (450 trained); District Leptospirosis reviews done - 8
4.4	Strengthen public health risk communication regarding vector borne disease control during predicted outbreaks	Plan for public health risk communication regarding vector borne disease control during predicted outbreaks, Communication as per the plan during predicted outbreaks	Existing plan, Existing communications during predicted outbreaks	–	20%	40%	Improved plan, Improved communications during predicted outbreaks by 2024	2021-2024	Three media seminars on leptospirosis conducted and two radio discussion conducted, Dengue added to outbreak mitigation guideline. Risk communication strategic plan available at Health Promotion Bureau
4.5	Inter-sectoral coordination and information system linked to the surveillance system for coordination with public health, local authorities and other stakeholders	Number of Inter-sectoral committees and frequency of reporting, Information sharing (ICT) platform	About 40% coverage, Not established	–	20%	30%	Inter sectoral committees for each disease and reported every quarter, Information sharing platform established	2021-2030	Discussions started and in progress. 14 Presidential task force meetings held on Dengue, Information sharing ICT platforms at Dengue Unit

							and maintained throughout till 2030		
NDC 5 - Reduce morbidity and mortality from extreme weather and climate events (floods, drought, landslides and other climate related emergencies)									
5.1	Strengthening timely and accurate early warning receipt and dissemination to health sector on possible extreme events or rainfall variability and linking them to national, regional, MOH and village level interventions	A system for receipt dissemination of information on disasters and early warning	The existing system tracks major events but lacks comprehensive coverage at national, regional, MOH, and village levels.	–	100%	100%	Comprehensive system for receipt dissemination of information on disasters and early warning in place	2021-2030	The system has been established.
5.2	Risk assessments for all hazards including climate-related events for the health sector	Risk assessment maps	In progress covering four provinces	–	–	30%	Risk assessments maps covering all the provinces by 2026	2023-2026	Completed for two provinces
5.3	Improved health preparedness for all hazards including climate-related disaster events at national, subnational, MOH and village level both in curative and preventive sectors	Health preparedness plans at national, provincial and district level	Plans for four provinces	–	15%	30%	Health preparedness plans at national, provincial and district level established by 2025	2021-2025	Completed for two provinces
5.4	Public awareness on health impacts of climate change and promotion of resilience designed and disseminated through traditional, electronic and social media on how to address immediate disaster risks	No of awareness programs and promotions conducted per year	Ongoing, the number of the programs conducted to be estimated	–	50%	60%	Target is to be established	2021-2030	Conducted awareness sessions

Annex 29: Progress made in implementing and achieving the NDCs in Urban Planning and Human Settlement sector

Tracking progress made in implementing and achieving the NDC for Adaptation under Article 7 of the Paris Agreement								
No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation on period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period 2021	Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)	Other comments
NDC 1 - Enhance the resilience of human settlements and infrastructure through mainstreaming climate change adaptation into national, subnational and local level physical planning (2025)								
1.1	Integrate most current climate change risk and vulnerability into physical planning at all levels	NPPD - the updated National Physical Plan (NPP)	Updating of National Physical Plan including climate change risk and commenced		Updated National Physical Plan published (2023)	2021-2023	The National Physical Plan is being updated with the integration of climate risk vulnerability. It is currently in the process of being translated into all three languages before gazetting.	
		The level of adherence to the items in the NPPD by stakeholders	NPP2019 (the latest version by then) adhered with by all stakeholders (however, there are challenges in ensuring full adherence	Completed	Full adherence by the stakeholders		11 Focus group discussions are conducted covering multiple sectors with relevant stakeholders	

1.2	Prepare the sub-national and local plans considering climate risks and vulnerability based on the recommendations of the National Physical Plan (NPP)							
1.2.1	Prepare Regional (Provincial) Physical Plans considering climate risks and vulnerability based on the recommendations of the National Physical Plan (NPP)	The number of Regional Physical Plans prepared incorporating climate risks and vulnerabilities	Identification and preparation of Regional Physical Plans in progress	Completed	Four regionals Physical plans (Eastern, Central, UVA, Central fragile zone)	2021-2024	The planning initiatives started before 2021 are still continuing. The key agency acknowledges the delay in plan preparation.	
1.2.2	Prepare Local development Plans in UDA declare areas	The number of Local Physical Plans prepared incorporating climate risks and vulnerabilities in UDA declared areas	Twenty (20) Local Physical Plans in UDA declared areas	Completed	All MCs, UCs and PSs (in UDA declared areas)	2021-2025	19 expired local development plans were updated and gazetted during the 2021–2023 period. Additionally, 25 new local area development plans were gazetted during this period, bringing the total number of local development plans gazetted to 44.	
1.2.3	Prepare Local Development Plans in LA area	The number of Local Physical Plans prepared incorporating climate risks and vulnerabilities	Identification of areas for Local Physical Plans in progress	Completed	275 Local Development Plans prepared	2021-2026	At present, local development planning is undertaken by the UDA (UDA) of Sri Lanka. Accordingly, the progress of this sub-activity aligns with 1.2.2. Under the current legal framework, NPPD (Town and Country Planning Ordinance and the subsequently amended National Physical Planning Act) serves as the leading agency for local area plan preparation in areas not declared as UDA areas under the UDA Act.	
1.3	Adhere to the guidelines Prescribed by the NPPD and UDA in all	Degree of Adherence	The criteria and evaluation methodology for the	Completed	100% (All projects adhered to the NPP and	2021-2025	In considering development activities in declared areas, the UDA plays an important role through its main office in Colombo, 13 district offices and 8 provincial offices. The UDA initiated a one-stop unit for the approval of development projects in the Colombo District in 2022 which later expanded to the	

	urban infrastructure projects and programmes		Degree of Adherence are not established		UDA Guidelines		Kalutara and Gampaha districts. A one-stop unit was also established at the CMC for developments less than 9,000 sq. ft. Further, obtaining the concurrence of the NPPD is required when undertaking national-scale infrastructure and development projects, although the NPPD is not listed as a responsible agency.	
1.4	Introduce adaptation measures such as urban zoning incorporating disaster risk, forest parks, ground water recharge, air passages/wind corridors, wise use of wetlands and roadside planting into urban planning, bio engineering technologies, etc. to build resilience to climate change	Number of Local/Urban Development Plans prepared with integration of climate change adaptation measures	Incorporated in gazetted 21 Development plans of the UDA	Completed	275 Local Development Plans	2021-2025	Zoning guidelines are included in all development plans. These guidelines consider climate change adaptation, as recognized and acknowledged by stakeholders in the respective local areas. Environmental strategies are also included in all local area development plans prepared by the UDA (refer to 1.2.2). These strategies address multiple aspects related to climate change adaptation and enhancing climate resilience, as recognized and acknowledged by stakeholders in the respective local areas.	
NDC 2 - Incorporate Disaster Risk Reduction (DRR) into urban and human settlement planning / implementation in areas of high vulnerability to climate change risks								
2.1	Develop Guidelines on Climate Change influenced Disaster Risk Management (DRM) for urban and human settlement planning	Number of guidelines prepared	Key Agencies have developed several guidelines (e.g. UDA – Wetland Conservation Development Plan for Western Province)		Target for the number of guidelines to be established	2021-2023	The draft copy of the National Disaster Management Plan (2022-2030) is available for reference. The plan identifies the preparation of DRM guidelines for the following areas: preparation of guidelines for retrofitting risky infrastructures (residential buildings, hotels, apartments, industrial buildings, historical and cultural heritage sites, schools, hospitals, community buildings, shelters, etc.); preparation of integrated guidelines for local-level disaster risk management and climate change adaptation guidelines and directives. Furthermore, the plan recognizes the need for hazard maps at appropriate scales for different levels of planning (from national to local), as emphasized by key agencies in the UP and HS sectors during the FGD. DRR strategies are integrated into local area plans prepared by the UDA. Refer to the Negombo Development Plan available via	

		Areas of coverage in the guidelines	Baseline to be established		Target for the areas of coverage to be established		https://www.uda.gov.lk/attachments/dev-plans-2021-2030/Negombo%20Development%20Plan%20-%20English.pdf as an example. Additionally, according to the annual report of the Disaster Management Center for 2022, disaster risks were assessed for 10 cities Gampaha, Negombo, Mannar, Kalutara, Kaduwela, Kolonnawa, Moratuwa, Welwetithurai, Point Pedro and Chavakachcheri).	
		Effectiveness of the guidelines	Baseline to be established	Completed	Incorporation of DRR into urban and human settlement planning based on the guidelines developed by key agencies.			
2.1.1	Review and revise Urban & Human settlement planning legislation to incorporate climate change influenced disaster risk management aspects	Urban Settlement Policy formulation incorporating climate change influenced disaster risk management aspects	Policy formulation not commenced		Urban Settlement Policy incorporating climate change influenced disaster risk management aspects by 2023	2021-2025	There is no urban settlement policy as indicated in the KPI. It should be under the National Housing Policy of NHDA.	
		Specific legislations for the implementation of the Urban Settlement Policy	Specific legislations not developed	Completed	Enacted specific legislations by 2025			
2.2	Design, Implementation & maintain infrastructure giving due consideration to the runoff system/drainage and flooding							
2.2.1	Design of infrastructure giving due consideration to the runoff system/drainage	Number of river basins covered in the designs	Three (03) - (Kelani, Gin, Nilwala river basins)		05 Additional River basing covered	2021-2030	There is a lack of clarity and understanding about the activity among relevant agencies. It is mentioned that the scope of the ID includes river floods, while local and urban flood management fall under the purview of the respective LAs and the SLLDC. However, it is noted that the CRIP project, undertaken by the MoIrrri. with WB funds, aimed at reducing the vulnerability of exposed people and assets to climate risks (floods, droughts, and landslides) and improving the government's	

	ge and flooding						capacity to respond effectively to disasters. Accordingly, the vulnerability to floods and droughts for 11 river basins (Kelani Ganga, Attanagalu Oya, Nilwala Ganga, Gin anga, Mahaweli Ganga, Malwathu Oya, Mundeni Aru, Maha Oya, Deduru Oya, Kala Oya and Gal Oya) was assessed, and long-term investment plans were developed to minimize the risks from flood and drought hazards. The project was carried out before 2021, but it has not been updated in the baseline mentioned for the NDC. A cross-reference should be established for this activity with the respective activity in the water sector.	
2.3	Incorporate slope stability and soil conservation measures in developing infrastructure in hilly areas	% No of plans rejected due to slope instability in hilly areas			Up-to date information on % No of plans rejected	2021-2024	During the period, 19,494 applications were received, and 178 were rejected (0.91%). The highest number of applications were received from the Galle, Kandy, Ratnapura and Badulla/Monaragala districts, with 4,258, 3,536, 3,060 and 2,997, respectively. The highest percentage of rejected applications came from the Matale district, where 61 out of 1,735 received applications were rejected. Similarly, 51% of the applications received from Badulla were also rejected.	There is no adequate system to monitor the implementation of recommendations provided by NBRO.
2.4	Assess landslide / flood risk to human settlement and infrastructure and introduce measures to reduce the vulnerability in high-risk areas	% of districts covered by the drought risk assessment and plans introduced	Baseline needs to be established (Maps available on the Landslide risk to human settlements and infrastructure)	Completed	100% (Implemented in all districts)	2021-2030	A total area of 32,842 sq. km, covering 14 districts, is mapped at a 1:50,000 scale. These districts include the entire Badulla, Galle, Gampaha, Hambantota, Kalutara, Kandy, Kegalle, Kurunegala, Matara, Monaragala, Nuwara Eliya, Ratnapura and parts of Colombo and Matale districts. The mapped area at a 1:10,000 scale (identified as high-risk areas through the 1:50,000 scale mapping) is available for several districts as follows: Badulla (47% covered), Colombo (3% covered), Galle (20% covered), Hambantota (15% covered), Kalutara (51% covered), Kandy (48% covered), Kegalle (72% covered), Kurunegala (6% covered), Matale (28% covered), Matara (21% covered), Monaragala (1% covered), Nuwara Eliya (80% covered) and Ratnapura (59% covered).	Need to update with data from NBRO. Inundation and risk maps are prepared, last updated 2019.
2.5	Assess drought risk to human settlement and introduce measures to reduce vulnerability in high-risk areas	% of districts covered by the drought risk assessment and plans introduced	Some assessment done, but not very comprehensive	Completed	100% (Assessment covering all high-risk areas)	2021-2024	Risk maps have been prepared for the entire country (2021). As revealed during discussions, the resolution and scale of these maps need to be enhanced to suit sub-national and local-scale planning.	

NDC 3 - Establish climate resilient built environment								
3.1	Integrate climate risk projections into climate resilient built environment strategies implemented by respective stakeholder institutions	Number of UDA development plans which has incorporated climate resilient concerns	Baseline to be established (this is done in planning, but need to identify the level of incorporation)	Completed	Climate risk projection is integrated to all the plans	2021-2025	Stakeholders operating at various levels are included in the local area planning process. Recent changes in the local area planning process have further emphasized this aspect. However, a clear baseline has yet to be established. Clarity about the activity and KPI is required through consensus among all agencies involved.	
3.2	Review and update climate resilient design strategies to address emerging climate risks	climate resilient design strategies and guidelines developed, updated and incorporated	There are related design and guidelines – for example National Green Building Standards integrated to UDA	Completed	Target to be established	2021-2030	All development plans include an environmental strategy that incorporates climate-resilient design strategies for the respective local areas, which subsequently leads to strategic projects and guidelines. Regarding the Green Building Certificate, a stepwise process is now mandatory for developments above 10,000 sq. ft (non-industrial) in UDA-declared areas. This came into effect during the period of 2021-2023.	Target to be established with consensus among all agencies involved.
3.3	Amend and gazette existing human settlement plans integrating climate resilient strategies 3.2	The number of existing human settlement plans integrating climate resilient strategies	20 Plans	Completed	275 Plans	2021-2025	A total of 63 local area development plans are in active status (cross-reference to 1.2.2).	
		Number of rules and regulations reviewed, updated and enforced	The existing rules and regulations are enforced		Target to be established		All local area plans are valid for a period of 10 years. During 2021-2023, 19 local area plans were gazetted after being updated. This revision brings changes to strategies, rules, and regulations applicable to the respective local areas.	
3.4	Review, update and enforce existing rules	Level of enforcement Consultation	The criteria and evaluation methodology	Completed	All applications for built environment	2021-2030		

	and regulations to prevent built environments in areas highly vulnerable to climate change	s, rules and regulations	for the Level of enforcement are not available		are aligned to the applicable rules and regulations			
3.5	Include sustainable built environment concepts into Architecture and Engineering curricula	List of degree /professional training programs having green building concept incorporated in the curricula	Baseline to be established (Presently, there are 37 UG/PG degrees/ diplomas offered by Engineering and Architecture disciplines)	Completed	Target to be established (e.g. Introduced the sustainable built environment concepts to all Architecture and Engineering curricula)	2021-2025	Baseline, target and tracking mechanism need to be established	
3.5.1	Introduce sustainable built environment concepts to capacity building	MoE-Planning division, Institute of Architects, Town & country planning Dept of Universities, SLSEA, SLEMA	Presently, there are a range of continuous professional development programmes conducted by different institutions, where the sustainable built environment concepts are covered)	Completed	Target to be established (e.g. Introduced the sustainable built environment concepts to all relevant CPD programmes)	2021-2030	In 2021 and 2022, no additional work was conducted specific to this activity.Note: GBSCSL Greening Sri Lanka Campaign 2021–2030, Introducing new guidelines for the certification of:-Net Zero Carbon Buildings-Green Schools-Revised version of existing Green BuildingsI-introducing a new training program for Green Labelling of sustainable building materials.	
3.6	Promote vertical housing solutions, where	No of vertical housing projects introduced to	Projects are Implemented but not specifically in high	Completed	Vertical housing solutions in place to all communities	2021-2030	The UDA's housing projects promote vertical housing solutions to enhance living standards and address urban challenges. Completed projects include Soysapura and Tangalle, while ongoing projects span areas like Ranpokunugama, Ambilipitiya, Anuradhapura, and others, with plans for additional developments in nine districts for low-income	At the FGD it is suggested to update key agency by also including

	appropriate to communities living in high climate risk areas	communities living in high climate risk areas	climate risk areas		living in high climate risk areas		families. Preliminary projects include middle-income housing and mixed-development projects in locations such as Wattala, Nittambuwa, and Sri Jayawardenepura Kotte. Since 2011, the Colombo Urban Regeneration Programme has constructed around 15,000 housing units to relocate low-income communities from flood-prone areas, integrating disaster risk mitigation measures like stormwater management and canal rehabilitation. These initiatives aim to provide flood-free, safe environments, increase property value, and improve socio-economic conditions.	Condominium Management Authority
NDC 4 - Minimize the impact of slow onset events (sea level rise) on coastal settlements and infrastructure (2030) reef coastal zone								
4.1	Design coastal settlements and associated infrastructure considering future sea level rise	Updating of Coastal Zone Management Plan (CZMP)	CZMP 2018 in effect for UDA declared areas		Updated CZMP for UDA declared areas by 2023	2021-2030	The Coastal Zone Management Plan for 2024-2029 has been updated, gazetted in 2024, and made publicly available.(Reference: https://www.coastal.gov.lk/images/pdf/CZMP_2429/CZCRMP_2024_PC_ENG.pdf)	As recognized the UDA declared areas related to this target include the area lying within the limits of one Kilometre(1K m) landwards of the Mean High-water line of the area
		Number of Local Area Development Plans of UDA	Baseline to be identified	Completed	Target to be established		Six local area development plans covering coastal areas were gazetted during the 2021-2023 period. These include Colombo, Galle, Negombo, Moratuwa, Dehiwala-Mount Lavinia, and Kalutara. Furthermore, three more local area development plans were gazetted for three additional coastal towns by the UDA (cross-reference 1.2.2 – these are extracted from the total list). These include Ambalangoda, Mannar, and Beruwala.	
4.2	Demarcate protection areas from sea level rise to facilitate for shifting urban densification inward	Number of maps prepared	2011 Version (Climate Change Vulnerability Database) in effect		Updated inundation maps, demarcate protection areas from sea level rise	2023-2030	Sea level rise maps, developed by the CC&CRMD based on available sea level predictions, have been published on the DMC website, allowing the public to access data on predicted future sea levels.(Refer: DMC Sea Level Rise Information)In addition, NDC efforts in the coastal and marine sector are ongoing to establish a reliable sea-level rise forecasting system for Sri Lanka, in collaboration with stakeholder agencies including CC&CRMD, Sri Lanka Navy, NARA, SLPA and the Survey Department.	

4.3	Prepare and commence implementation of Risk Management Plans (RMPs) for existing coastal infrastructure and settlements	Number of RMPs	Previous versions RMPs available		RMPs prepared for all the existing coastal infrastructure and settlements	2023-2025	The CC&CRMD develops both annual and five-year coastal protection plans, prioritizing protections based on erosion predictions and departmental data to safeguard existing infrastructure and coastal settlements.-A coastal risk index has been incorporated into the Coastal Zone Management Plan to establish and enforce setback limits, reducing risks for future developments.-The National Disaster Management Plan (NDMP) 2023–2030 recognizes the promotion of investment in critical infrastructure and systems to mitigate impacts from climate change and future cascading disaster risks (3.3), along with several related operational strategies (for cross-reference).	Clarity and specific description on coastal infrastructure and human settlements is important for setting the target and monitoring the implementation.
		Level of implementation of RMPs	Level of implementation is to be identified		The target for level of implementation will be identified through an established methodology and criteria		Need to be established	As the next step profiling of such locations with clear risk identification.

Annex 30: Progress made in implementing and achieving the NDCs in Tourism and Recreation sector

No	Activities / Sub Activities	Key Performance Indicator (KPI)	Baseline(s)	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period			Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s)
				2021	2022	2023			
NDC 1- Build resilience through sustainable tourism practices and improved risk preparedness in destinations of high climate change vulnerability - 2025									
1.1	Undertake studies to assess climate impacts on tourism, carrying capacity studies and identification of tourism facilities in areas that are vulnerable to climate change	Studies on climate impacts on tourism in most vulnerable sites 2. Carrying capacity studies and identification of tourism facilities in critical sites.	1-0 2-0	Started work process in 2021 and completed two studies in 2022 for Sigiriya and Knuckles with UNDP funding assistance	Private sector (industry) Sustainable Certification enhance awareness and SME sector certification continued	Take all measure to implement carrying capacity study recommended, Carrying capacity studies and identification of tourism facilities in 8 critical sites completed including Kalpitiya and Hikkaduwa	2021-2025	Apart from Sigiriya and the Knuckles Range, six additional crucial sites have been selected for carrying capacity studies. However, due to limited funding, it was not possible to conduct studies at all locations. Additionally, Ella has now become a crucial site where carrying capacity concerns need to be addressed.	
1.2	Identification and promotion of adaptation measures in the above areas	Number of destination covered	Partially considered in the master plan	Identification of Sustainable initiatives and resilient actions for reaching NDC 1	Signage implementation, site preparation by CCF undertaken	Properly presented signages for visitor available and home stay awareness in Knuckles initiated	Sigiriya to be certified as a sustainable destination using GSTC criteria by Green Destination	2024-2025	Initiatives have begun to promote niche markets, including adventure tourism, spiritual tourism, the Ramayana trail, pekoe trail eco-tourism, and wellness tourism. For conventional markets, the focus is on expanding reach within the European, Scandinavian and Russian markets, aiming to attract untapped tourist segments a goal that is currently progressing.

1.3	Advocate diversified tourist attractions and products (e.g.: Cultural, Adventure, Lifestyle, Festivals and Marine Tourism etc.) as alternatives to identified vulnerable destinations	Alternative measures for vulnerable area	0	Plan for developing Sustainable Destination	Identified Regional destination with PCs which include climate adaptation	1st - Sigiriya. 2- Seethawaka, 3- Madunagala	Ensure all stakeholders are aware and ready to comply with criteria guided management method to minimise climate risk	2021-2025	Marine tourism road map was developed apart from that requested to ADB to develop master plan for Marine tourism Apart from Sigiriya destination SLTDA has initiated to develop and promote sustainable divinified attraction tourist attraction with support of ADB Sri Lanka tourism need more funds to develop more destinations against climate change
1.4	Inclusion of guidelines/principles for sustainable tourism practices relevant to different stakeholders	GSTC guidelines covering destination, accommodation on an tour operation	Globally available accommodation guidelines (2019) & destination guidelines (2020) localized. Tour operator guidelines completed	Focus was on destination development for sustainable certification.Thus call proposal from nine provinces an de selected one from each to follow GSTC guidelines for the same	Destination certification initiated. 1st - Sigiriya. 2- Seethawaka, 3- Madunagala	SME sector certification initiated and continue with destination certification process and 1st year completed.	Guideline on sustainable tourism Certification and criterial make available with necessary awareness for the industry and SME to use when wanted. Promotion and implementation of the same with stakeholders	2021-2025	The National Sustainable Certification program is designed to encourage the achievement of sustainable development goals
1.5	Increased number of tourism establishments and destinations certified under the National Sustainable Tourism Certification Scheme by Sri Lanka Tourism Development Authority (SLTDA) in collaboration with Global Sustainable Tourism Council (GSTC)	Number of certified destination and accommodation establishments & tour operators/ travel agencies	1-0. 2.37 accommodation establishments certified in 2019	Awareness conducted but sustainable Certification was on hold during COVID pandemic	Identified Regional destination with PCs which include climate adaptation	1st - Sigiriya. 2- Seethawaka, 3- Madunagala	1-9 destinations in 9 provinces certified / 2-75 accommodation, establishments certified	2021 - 2024	In 2018, 37 hotels received National Sustainable Certification from the SLTDA. In 2023/2024, 101 Small and Medium Enterprises (SMEs) were certified under the Green Destination Certification by the SLTDA. Applications for the 2025 Green Destination Certification have been opened and an awareness program on sustainable tourism practices is planned for the informal sector

2	Introduce risk reduction and risk transfer mechanisms for climate – Induced disasters affecting tourism (2025)								
2.1	Strengthen early warning systems and capacity building in most vulnerable tourism destinations	Strengthened early warning systems in vulnerable destination. Capacities of stakeholders of vulnerable areas	Early warning systems exists but not specifically on vulnerable tourism destination as	Use the same as Disaster management Early warning system	Use the same as Disaster management Early warning system	Use the same as Disaster management Early warning system	All 5 vulnerable areas covered with strengthened early warning systems. Capacities of stakeholders of all 5 areas built	2023-2025	Introduce an early warning system for tourism industry, currently DMC support to tourism sector service provider use mobile company and association network
2.2	Implement coastal rehabilitation and protection measures together with CCD and MEPA in critical areas	Coastal areas (if any) of all 5 vulnerable areas	Ongoing main task of CC&CRMD	5.1 km protected against coastal erosion	3.4 km protected against coastal erosion	1.5 km protected against coastal erosion	Coastal areas (if any) of all 5 vulnerable areas covered	2021-2026	Initiation of blue flags certification in 5 locations by MEPA. Beach management were formed in all the coastal areas.
2.3	Expand development of coastal tourism zonal planning with CCD, UDA and SLTDA covering all vulnerable coastal areas	Expanded zonal plans for vulnerable costal area	Zonal plans are available for Pasikudha, Yala & Bentota	Eight development plans (Negambo, Moratuwa, Galle, Kaluthara, Kalpitiya, Mannar, Beruwala, Ninthavur)	One development plan (Colombo MC)	Three development plans (Karachchi, Ambalangoda)	Get certified coastal area/Beach destination as Blue Flag Destination	2021 - 2025	Coastal zone planning is currently underway in Kalpitiya and Arugam Bay, while the Blue Flag Zone has been initiated in Mirissa/ coastal setbacks (building reservations) updated in National Coastal Zone Management plan 2024-2029/ preparation of sea level rise inundation maps (risk maps) in preliminary stage
2.4	Develop climate inclusive insurance scheme	Climate inclusive insurance scheme in line with international risk transfer mechanism	0	Due to significant financial constraints and other major challenges, not process any work			Climate inclusive insurance scheme developed	2023-2026	MOT intervention and continuous follow-up is essential
NDC 3- Promote climate resilience in the tourism sector by introducing green building design to all new constructions and refurbishments									

3.1	Review and update existing Green Building Guidelines (GBG) specific to tourism to include climate change and ecological aspects	GBG specific to tourism industry	Existing GBG	13 Registered Buildings for NGB Certifications (12 for Government Sector & 1 for Private Sector	21 Registered Buildings for NGB Certifications (7 for Government Sector & 15 for Private Sector	40 Registered Buildings for NGB Certifications (5 for Government Sector & 35 for Private Sector	Ensure green building guidelines are taken into consideration at planning and best practices are adopted. Developer is aware the need initial need for Green building and Sustainable Tourism Certification	2021-2023 (entered to a MOU in 2023) Continue its implementation	National green building regulations (Blue Green SL) enforced by UDA buildings above 1000 m ²
3.2	Legalize GBG specific to tourism	New gazette	UDA had prepared the document	National green building certification for all LA areas declared under the UDA (13.2021-2022, 35-2023)		Updated GBG gazetted	2023-2025	Gazetted under the UDA Planning & Building Regulations (General) 2019 - 2030 in Thursday, July 08, 2021 No. 2235/54)	
3.3	Enforce the above guidelines for all new constructions and refurbishments in the tourism sector	Number of LAs that have improved the guidelines	0	National Green Building Certification for all LA areas declared under the UDA (13-2021,21-2022,35-2023)		Implement with LA's, UDA and SLTDA declared areas with developed Tourism zone guidelines by SLTDA	2024-2025	The National Green Building certification is issued through a process that evaluates the design of new buildings and inspects them post-construction to ensure adherence to sustainable green building practices. This certification is gazetted under the UDA Planning & Building Regulations (General) 2019–2030, as published on Thursday, July 8, 2021, No. 2235/54.	
3.4	Initiate programmes for the Architects and Engineers responsible for designing tourism-related structures through their respective professional associations on the Green Building Codes on tourism	Awareness of all relevant stakeholders	Curricula of existing professional courses on GB not specifically focusing on tourism industry offered by professional associations	National Green Building Certification for all LA areas declared under the UDA (13-2021,21-2022,35-2023)		Awareness of all relevant stakeholders and provide all necessary information to new investors	2023-2030	SLITHM is currently included the sustainability lessons in most of their criteria. Further best practices initiated in house.	

3.5	Dissemination of Green Building Code on tourism with planning committees of the relevant local authorities	Updated SLTDA approval system	SLTDA existing approval system does not have GB guidelines for new constructions and refurbishments	Green building guidelines has initiated for 2021 and 2023 started to implement	GB guidelines for all new constructions and refurbishments included in SLTDA approval system	2026	The target has been achieved with the initiation of Green Building guidelines, supported by USAID funding and the Green Building Council. These guidelines are currently in the implementation stage. However, not all criteria within the guidelines are mandatory.
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Annex 31: The initial report under the Article 6 of Paris Agreement before the first transfer of ITMOST

The initial report referred to in decision 2/CMA.3, annex, chapter IV.A (Initial report)^{1, 2, 3}

[English only]

Party	Sri Lanka
NDC period	2021-2030
Report number for the NDC period⁴	1
Report type	
Initial report	<input checked="" type="checkbox"/>
Updated initial report	<input type="checkbox"/>
Updated initial report number	1
Version⁵	1.0
Date	dd/mm/yyyy
Name(s) of cooperative approach(es) included in this report <i>(Include a line for each additional cooperative approach)</i>	The Joint Crediting Mechanism between the Government of the Democratic Socialist Republic of Sri Lanka and the Government of Japan

¹ This template is for voluntary use to facilitate the preparation and submission of the initial reports and updated initial reports referred to in decision 2/CMA.3, annex, chapter IV.A (Initial report).

² The list of the acronyms and abbreviations used in this template are available in decision 6/CMA.4: <https://unfccc.int/documents/624474>.

³ References to chapters and paragraphs in the outline are to chapters and paragraphs in the annex to decision 2/CMA.3, unless stated otherwise. “Article” refers to an Article of the Paris Agreement.

⁴ Ascribe sequential number for updated initial reports. The number ‘1’ is reserved for the initial report.

⁵ Ascribe version number as follows: decimal increase for minor revisions (typos, corrections) and digit increase for content changes.

Note: For updated initial report fill in only section IV. Information on each cooperative approach (para. 18(g–i), para. 19 of the annex to decision 2/CMA.3).

I. Participation responsibilities (para. 18(a))

A. Information on how the Party ensures that it is a Party to the Paris Agreement (para. 18(a), para. 4(a), to be updated by para. 21(a))

Sri Lanka ratified the Paris Agreement on 21 September 2016 and continues to be a Party to the Paris Agreement.

B. Information on how the Party ensures that it has prepared, communicated, and is maintaining an NDC in accordance with Article 4, paragraph 2 (para. 18(a), para. 4(b), to be updated by para. 21(a))

Sri Lanka communicated the updated NDC on 24 September 2021 and continues to implement the updated NDC in accordance with the national plans and policies

C. Information on how the Party ensures it has arrangements in place for authorizing the use of ITMOs towards the achievement of NDCs pursuant to Article 6, paragraph 3 (para. 18(a), para. 4(c), to be updated by para. 21(a))

The government of Sri Lanka is processing the Carbon Trading Policy and Guiding Principle along with the authorization system under the Ministry of Environment, and they are expected to be finalized in the coming months.

D. Information on how the Party ensures it has arrangements in place that are consistent with Article 6, paragraph 2, guidance and relevant decisions of the CMA for tracking ITMOs (para. 18(a), para. 4(d), to be updated by para. 21(a))

Under the Joint Crediting Mechanism (JCM) with Japan, Sri Lanka is part of the JCM registry to record issuances and transactions relating to the credits issued by the Sri Lanka projects developed under the JCM, and every tonne of CO₂-eq emission reduction will have a unique identifier assigned to as each credit.

The authorized JCM credits are issued and tracked in the Japan side's JCM registry. Sri Lanka is currently developing its Digital Platform to track the cooperative approaches and the same will be launched in the coming months. Both registries are developed in accordance with the Common Specifications of the JCM Registry. The issuance records of JCM credits can be found on the country page of the JCM website <<https://www.jcm.go.jp/>>.

Integration of the national registry of Sri Lanka and the JCM registry is under process and expected to be finalized in the coming months.

E. Information on whether the most recent national inventory report required in accordance with decision 18/CMA.1 has been provided (para. 18(a), para. 4(e), to be updated by para. 21(a))

Sri Lanka provided its most recent national inventory report in the Third National Communication submitted on 1 December 2022, covering national greenhouse gas inventories from 2000 until 2010.

F. Information on how the Party ensures participation contributes to the implementation of its NDC and long-term low-emission development strategy, if it has submitted one, and the long-term goals of the Paris Agreement (para. 18(a), para. 4(f), to be updated by para. 21(a))

To meet its conditional contribution, Sri Lanka needs to mobilize substantial finance through various mechanisms set up under the UNFCCC's, Paris Agreement and leverage bilateral agreements for low-carbon development.

II. Description of the Party's NDC, as referred to in decision 18/CMA.1, annex, paragraph 64, where a participating Party has not yet submitted a biennial transparency report (para. 18(b), to be updated by para. 21(b))

A. Target(s) and description, including target type(s) (decision 18/CMA.1, annex, para. 64(a))

1. Sri Lanka interprets unconditional policy responses as those actions that have been identified in national plans and programmes, prioritized for domestic investments (public and private) which can be implemented with domestic capacity. These actions amount to 4.0% of GHG emissions reduction respective to the BAU scenario for the period 2021-2030.
2. conditional NDC actions account for an additional 10.5% of GHG emissions reduction respective to the BAU scenario for the period 2021-2030.
3. Sri Lanka expects to achieve its Carbon Neutrality by 2050

B. Target year(s) or period(s), and whether they are single-year or multi-year target(s) (decision 18/CMA.1, annex, para. 64(b))

Target year: 2030, single-year target

C. Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s) (decision 18/CMA.1, annex, para. 64(c))

BAU Scenario for the period 2021-2030

Quantity: 14.5%, 67,252,400MT CO₂-eq {*Reference: Updated NDC in 2021, can give the page number of the NDC*}

D. Time frame(s) and/or periods for implementation (decision 18/CMA.1, annex, para. 64(d))

2021-2030 {*Reference: Updated NDC in 2021*}

E. Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases (decision 18/CMA.1, annex, para. 64(e))

As mentioned under the NDC following sectors are covered

1. Electricity (power; electricity generation and end-use)
2. Transport
3. Industry
4. Waste Management
5. Forestry
6. Agriculture (including livestock)

As mentioned under the NDC following GHGs are covered

- 1.CO₂
- 2.CH₄
- 3.N₂O

{Reference: Updated NDC in 2021}

F. Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs under Article 4 of the Paris Agreement (decision 18/CMA.1, annex, para. 64(f))

To meet its conditional contribution, Sri Lanka needs to mobilize substantial climate finance from mechanisms set up by the UNFCCC, the Paris Agreement's

cooperative approaches, and leverage bi-lateral agreements for low carbon development *{Reference: Updated NDC in 2021}*

G. Any updates or clarifications of previously reported information (e.g. recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches) (decision 18/CMA.1, annex, para. 64(g))

Not applicable.

III. Information on ITMO metrics, method for applying corresponding adjustments, and method for quantification of the NDC (para. 18(c-f))

A. ITMO metrics (para. 18(c))

The ITMO metric is tonnes of carbon dioxide equivalent (tCO₂-eq).

B. Method for applying corresponding adjustments as per chapter III.B (Application of corresponding adjustments) (para. 18(c))

1. Description of the method for applying the corresponding adjustment for multi- or single-year NDCs that will be applied consistently throughout the period of NDC implementation, if applicable (para. 18(c))

Sri Lanka will apply corresponding adjustments by using the method referred to in decision 2/CMA.3, annex, III.B., [para. 7(a)(ii)], calculating the average annual amount of ITMOs first transferred and used over the NDC implementation period 2021 to 2030.

Sri Lanka published its positive list, enabling the development of projects under cooperative approaches, and explicitly mentioned the percentage details of emission reductions that could be authorized.

2. Description of the method for applying corresponding adjustments where the method is a multi-year emissions trajectory, trajectories, or budget, if applicable (para. 18(c))

Not applicable.

C. Quantification of the Party's mitigation information in its NDC in t CO₂-eq, including the sectors, sources, GHGs and time periods covered by the NDC, the reference level of emissions and removals for the relevant year or period, and the target level for its NDC or, where this is not possible, the methodology for the quantification of the NDC in t CO₂ eq (para. 18(d))

Sectors and sources covered by the NDC: electricity (power; electricity generation and end-use), transport, industry, waste management, forestry, agriculture (including livestock)

GHGs covered by the NDC: CO₂, N₂O, CH₄

Time period covered by the NDC: 2021 - 2030

Reference Level of emissions and removals for the relevant year period: BAU at the time of 2010 to 2030

The target level for the NDC: Unconditional 4.0% of GHG emissions reduction respective to the BAU scenario for the period 2021-2030.

- Conditional NDC actions account for an additional 10.5% of GHG emissions reduction respective to the BAU scenario for the period 2021-2030.
- Sri Lanka expects to achieve its Carbon Neutrality by 2050

{Reference: Updated NDC in 2021}

D. Quantification of the Party's NDC, or the portion in the relevant non-GHG indicator, in a non-GHG metric determined by each participating Party, if applicable (para. 18(e))

Not applicable.

E. For a first or first updated NDC consisting of policies and measures that are not quantified, information on the quantification of the Party's emission level resulting from the policies and measures that are relevant to the implementation of the cooperative approach and its mitigation activities for the categories of anthropogenic emissions by sources and removals by sinks, as identified by the first transferring Party pursuant to paragraph 10, and the time periods covered by the NDC (para. 18(f))

Not applicable.

IV. Information on each cooperative approach (para. 18(g–i), para. 19)

Note: For the initial report and the updated initial report, chapters A–H below should be repeated for each cooperative approach. For each further cooperative approach, each participating Party shall submit the information referred to in para. 18(g–i) of the annex to decision 2/CMA.3 in an updated initial report (decision 2/CMA.3, annex, para. 19).

A. Copy of the authorization by the participating Party (para. 18(g))

Authorization decisions taken by Sri Lanka will be made publicly available and can be found on < <https://env.gov.lk/web/index.php/en/publications/other-publication#implementation-of-the-article-6-of-the-paris-agreement-in-sri-lanka>>

The above link represents the list of mitigation activities that could be developed in Sri Lanka under cooperative approaches. These activities will indicate the percentage level of emission reductions that would be authorized.

B. Description of the cooperative approach (para. 18(g))

The Joint Crediting Mechanism (JCM) facilitates the diffusion of leading decarbonizing technologies, products, systems, services, and infrastructure as well as the implementation of mitigation actions, and contributes to the sustainable development of Sri Lanka.

The JCM is implemented through investment by Japanese entities in partnership with Sri Lanka's entities and implemented consistently with the guidance on cooperative approaches, referred to in Article 6, paragraph 2 of the Paris Agreement, contributing to the achievement of both countries' NDCs while ensuring the avoidance of double counting through corresponding adjustments.

Both sides establish a Joint Committee (JC) consisting of representatives from both governments. The JC develops rules and guidelines necessary for the implementation of the JCM.

C. Duration of the cooperative approach (para. 18(g))

The JCM covers the period starting from the signing of the bilateral document until 2030. Both sides consider possible extension of the above-mentioned period which will be concluded before the end of its duration.

{Reference: JCM MoC (as of 10 October 2022) para12}

D. Expected mitigation for each year of the duration of the cooperative approach (para. 18(g))

Estimated emissions reductions in each year until 2030 will be included in the Project Design Document (PDD), a document that includes monitoring methods and estimated emission reductions. Actual reductions will be recorded in the PDD based on the methodology agreed upon for each mitigation activity.

E. Participating Parties involved in the cooperative approach (para. 18(g))

Sri Lanka and Japan

F. Authorized entities (para. 18(g))

Sri Lanka approves Project Idea Notes (PIN), including project participants in Sri Lanka to participate in the JCM projects. The list of project participants in Sri Lanka can be found on the country page of the JCM website.

G. Description of how the cooperative approach ensures environmental integrity (para. 18(h), to be updated by para. 22(b))

1. Description of how the cooperative approach ensures that there is no net increase in global emissions within and between NDC implementation periods (para. 18(h)(i), to be updated by para. 22(b)(i))

In accordance with the bilateral document, both governments mutually recognize that part of the credits generated from emission reductions and removals by the implementation of JCM projects (hereinafter referred to as “JCM credits”) may be used towards the achievement of Japan’s NDC while ensuring that double counting is avoided on the basis of

corresponding adjustments, consistent with the Article 6.2 guidance.

Reference: JCM MoC}

The JCM ensures that there is no net increase in emissions within and between NDC implementation periods through methodologies with conservative reference levels (described in G.2.) and the application of corresponding adjustments by both governments in accordance with the guidance of the CMA. *{Reference: JCM Guidelines for Developing Proposed Methodology}*

Additionally, in accordance with para. 8(b) of Annex to decision 2/CMA.3, JCM credits will be used towards achievement of Japan's NDC within the same NDC implementation period as when they occurred to ensure there is no net increase in global emissions within and between NDC implementation periods.

2. Description of how the cooperative approach ensures environmental integrity through robust, transparent governance and the quality of mitigation outcomes, including through conservative reference levels and baselines set in a conservative way and below 'business as usual' emission projections (including by taking into account all existing policies and addressing uncertainties in quantification and potential leakage) (para. 18 (h)(ii), to be updated by para. 22(b)(ii))

JCM is established by a bilateral document signed between both governments and implemented in line with the relevant domestic laws and regulations. In accordance with the bilateral document, the JC is established as the governing body, consisting of government officials from Japan and each partner country. All the rules and guidelines as well as decisions made by the JC are made publicly available on the JCM website. In addition, all calls for public input on proposed methodologies and proposed projects are informed on the same website.

The methodologies are developed in accordance with "JCM Guidelines for Developing Proposed Methodology", which explains the key concepts such as reference emissions and eligibility criteria under the JCM. The JC assesses and considers the approval of the proposed methodologies. *{Reference: JCM Guidance for the Implementation of the JCM}* The list of approved JCM methodologies can be found on the JCM website.

The JCM Guidelines for Developing Proposed Methodology stipulates that the reference emissions are calculated to be below business-as-usual (BAU) emissions which represent plausible emissions in providing the same outputs or service level of the proposed JCM project. Therefore, the baselines are to be set in such a way that emission reductions would not overestimate mitigation from an activity. *{Reference: JCM Guidelines for Developing Proposed Methodology}*

3. Description of how the cooperative approach is minimizing the risk of non-permanence of mitigation across several NDC periods and how, when reversals of emission reductions or removals occur, the cooperative approach will ensure that these are addressed in full (para. 18(h)(iii), to be updated by para. 22(b)(iii))

Where there is a risk of non-permanence, arrangements to minimize the risk of non-permanence and address the reversals will be established.

H. Additional description of the cooperative approach (para. 18(i))

1. Description of how the cooperative approach minimizes and, where possible, avoids negative environmental, economic, and social impacts (para. 18(i)(i), to be updated by para. 22(f))

The JCM has guidelines for Project Design Documents (PDD) in which the PPs are requested to follow legal requirements of environmental impact assessment for the proposed project. For social risks, the PPs will gather opinions from stakeholders through local stakeholder consultation as required in the same guidelines. *{Reference: JCM Guidelines for Developing Project Design Document and Monitoring Report}*

The Guidelines for Developing Sustainable Development Implementation Plan and Report is adopted as part of the JCM project cycle. When designing a proposed JCM project, PPs are required to apply these Guidelines and provide a comprehensive description of an implementation plan on contributions to sustainable development (hereinafter referred to as “SD”) through their project. PPs should conduct an ex-ante analysis of the contribution to SD using the SDIP (Sustainable Development Implementation Plan) form and an ex-post evaluation of the contribution to SD using the SDIR (Sustainable Development Implementation Report)

form. The Guidelines for Developing Sustainable Development Implementation Plan and Report address issues of both environmental and social risks. The guidelines oblige PPs to report how environmental and social risks are dealt with.

2. Description of how the cooperative approach reflects the eleventh preambular paragraph of the Paris Agreement, acknowledging that climate change is a common concern of humankind, Parties should when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of Indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity (para. 18(i)(ii), to be updated by para. 22(g))

Sri Lanka monitors each project's compliance with domestic laws and regulations, ensuring that the eleventh preambular paragraph of the Paris Agreement is respected by the JCM projects.

{Any further information on the country's domestic laws or guidelines on human rights applicable to JCM projects}.

Additionally, the "Guideline on Gender Equality for the JCM" was developed to provide basic principles and specific recommendations on gender equality and to encourage stakeholders, especially project participants who implement a JCM model project, to take action at all the stages of the project cycle (planning, implementation, and monitoring).

3. Description of how the cooperative approach is consistent with the sustainable development objectives of the Party, noting national prerogatives (para. 18(i)(iii), to be updated by para. 22(h))

The contribution to sustainable development objectives is ensured through the JC, where government representatives from Sri Lanka and Japan make decisions on the implementation of the JCM. The JC has the authority to decide on the registration of the JCM projects by which the representatives from a partner country would have the opportunity to consider the contribution to their SD objectives, noting national prerogatives. Therefore, Japan is implementing projects that reflect the sustainable development aspirations of partner countries.

Furthermore, the Guidelines for Developing Sustainable Development Implementation Plan and Report is adopted as part of the JCM project cycle. Project participants are encouraged to refer to, as appropriate, the related local and/or national regulations in their preparation of SDIP and SDIR.

4. Description of how the cooperative approach applies any safeguards and limits set out in further guidance from the CMA pursuant to chapter III.D (para. 18(i)(iv), to be updated by para. 22(i))

Not applicable.

5. Description of how the cooperative approach contributes resources for adaptation pursuant to chapter VII (Ambition in mitigation and adaptation actions), if applicable (para. 18(i)(v), to be updated by para. 22(j))

In accordance with the bilateral document, both governments aim for contributions to assist the adaptation efforts of developing countries. *{Reference: JCM MoC (as of 10 October 2022) para11}* Any further information as per discussions between Japan and partner countries or as applied by Sri Lanka voluntarily. Any updates will be communicated by an updated initial report.

6. Description of how the cooperative approach delivers overall mitigation in global emissions pursuant to chapter VII (Ambition in mitigation and adaptation actions), if applicable (para. 18(i)(vi), to be updated by para. 22(k))

The JCM aims to deliver overall mitigation of global emissions. Any further information as per discussions between Japan and partner countries or as applied by the Sri Lanka on the voluntary basis. Any updates will be communicated in the updated initial report.

Chapter 4

Annex 32: Information on Financial support received

Exchange rate used: USD 1 = LKR 293

Title of activity, programme, project or other	Programme/ project description	Channel	Recipient entity	Implementing entity	Amount received (climate-specific)		Time frame	Financial instrument	Status	Type of support	Sector	Subsector	Contribution to technology development and transfer objectives	Contribution to capacity-building objectives	Status of activity	Use, impact and results	Additional information
					Domestic currency	USD Mn											
Sri Lanka Energy Program	Making power sector market-based, secure, reliable, and sustainable, attracting investments for renewable energy.	USAID	Chemicals International	Chemicals Sri Lanka	5,538 Mn	18.9 Mn	2021-26										https://www.usaid.gov/sri-lanka/environment-and-energy
Development of Kurunegala as a climate smart city		Climate Technology Centre and Network	United Nations Environment Programme	CTCN	43.95 Mn	0.15 Mn	2020-2021	Grant	Disbursed	M (Cross cutting)	Energy, Gender	Energy Efficiency, Transport	1	1	Completed		Development of Kurunegala as a climate smart city (mitigation element) Climate Technology Centre & Network Thu, 08/29/2018
Climate Smart Sustainable Cities		GEF	MOE	MOE	3,780 Mn	12.9 Mn	Concept approved in 2024	Grant	Committed	M/ A	Energy, Transport	Energy, Transport	1	1	Planned		Climate Smart Sustainable Cities GEF

Accelerating Industries Climate Response in Sri Lanka Project	Implement industrial sector NDCs to reduce GHG emissions through advanced technologies and energy efficiency strategies.	EU	UNIDO	MoE/MoI/MoP	2,382 Mn	8.13 Mn	2022-2027	Grant	Received	M	Industry	Energy intensive industries	1	1	On-going		https://www.industrialenergyaccelerator.org/where-we-work/sri-lanka
Green Policy Dialogue Facility (GPDF)	Establish a technical assistance platform to exchange policy experiences between the EU and GoSL, promoting technology transfer and innovative solutions.	The EU Green Recovery Facility	Expertise France	Expertise France	1,556 Mn	5.31 Mn	2023-27	Grant	Received	M	Energy	Renewable Energy, Energy Efficiency	1	1	On-going		https://www.eeas.europa.eu/delegations/sri-lanka/eu-and-expertise-france-support-sri-lanka-its-green-economic-recovery_en?s=237
New solutions for low-emission food production in Sri Lanka	Minimize energy losses of energy-intensive SMEs in food sector	IKI Small Grants	NCPC	NCPC	35 Mn	0.12 Mn	2022-2024	Grant	Received	M	Energy	Energy Efficiency	1	1	On-going		https://iki-small-grants.de/k1project/new-solutions-for-low-emission-food-production-in-sri-lanka/
Rooftop Solar Power Generation Line of Credit Project	Long-term debt financing for rooftop solar systems. Introduces technical and commercial frameworks, technical guidelines, and	ADB	MoPE	SLSEA, CEB, LECO	14,600 Mn	50 Mn	2017-25	Loan	Under Implementation	M	Energy	Renewable Energy, Energy Efficiency	1	1	On-going		Sooriyabala Sangaramaya Sri Lanka Sustainable Energy Authority

	standards for rooftop solar.																
AI-Powered Demand Management System for Sri Lanka	Develop and pilot a demand management system in selected households, demonstrating Sri Lanka's proficiency in utilizing advanced technologies	USAID	Chemicals International	Alta Vision	53 Mn	0.18 Mn	2023-24	Grant	Under Implementation	M	Energy	Energy Industry, DSM	1	1	On-going		AI-Powered Demand Management System for Sri Lanka
GEF Small Grants Programme Operational Phase 6	Enabling community-based organizations to take adaptive landscape management for socio-ecological resilience	Multilateral - GEF	Ministry of Environment	UNOPS & UNDP	32921 641	24970 78	2017-2023	Grant	Received	M & A	Agriculture, Forestry, Energy, Water and Sanitation, Tourism		1	1	Completed		
PPG GEF Small Grants Operational Phase 7	Enabling community-based organizations to take adaptive landscape management for socio-ecological resilience	Multilateral - GEF	Ministry of Environment	UNDP	14.85 Mn	50,000	2021-2021	Grant	Received	A	agriculture, forestry, energy, water & sanitation, tourism		0	0	Completed		
Institutional Strengthening Phase 13	strengthen institutional capacity of the National Ozone Unit to meet the obligation to	Multilateral - Montreal Protocol	MOE	MOE	32921 641	171,592.00	2021-2022	Grant	Received	M	Industry		1	1	Completed		

	the Montreal Protocol and enhancing awareness on Ozone Depleting Substance																
Phasing out HCFCs in Sri Lanka under Montreal Protocol	phase-out Hydrochloro fluorocarbons (41b) and phase-out 2.2 Metric Tons of Hydrochloro fluorocarbons	Multilateral - Montreal Protocol	Ministry of Environment	UNDP	9.2 Mn	31,100	2020-2021	Grant	Received	M	Industry		1	1	Completed		The funds recorded are for the tranche received for 2020-2021 only
SL-Climate finance for renewables	institutional strengthen and capacity building to access international climate finance, reduce GHG emissions	World Bank	Ministry of Power and Renewable Energy, MMD &E	SLCF CEB	3,516 Mn	12 Mn											
New solutions for low-emission food production in Sri Lanka	To minimize the energy losses of energy-intensive Small and Medium Enterprises (SMEs) in the food sector	IKI Small Grants	NCPC Sri Lanka	NCPC Sri Lanka	35 Mn	0.12 Mn	2 years	Grant	Received	M	Energy	Energy Efficiency	1	1	Ongoing		https://iki-small-grants.de/klproject/new-solutions-for-low-emission-food-production-in-sri-lanka/
Rooftop Solar Power Generation Line of Credit (RSPGLoC) Project	long-term debt financing for installing rooftop solar PV systems including technical guidelines	ADB	GoSL	SLSEA, CEB, LECO	14,600 Mn	50 Mn	2017-2025	Loan	Under Implementation	M	Energy	Renewable Energy, Energy Efficiency	1	1	Ongoing		Sooriyabala Sangaramaya Sri Lanka Sustainable Energy Authority

	and standards,																
Climate Resilient Integrated Water Management Project	Strengthening the resilience of small holder farmers in the Dry Zone	Multilateral - GCF	Ministry of Irrigation	Ministry of Irrigation	11,315 Mn	38,1 Mn	2017-2025	Grant	Received	A	Agriculture, Water, Disaster Risk Resilience		1	1	Ongoing		
Agriculture Sector Modernization Project (ASMP)	increase agriculture productivity, boost the value addition of smallholder farmers and agribusinesses to improve the access to markets	World Bank	Ministry of Agriculture & Plantation Industry	MoA with support from the IDA of WB	17,000 Mn + 8000 Mn	\$58.63 Mn, Additionally, EUR 23.31 Mn	2016-2023	co-financing from the European Union	Completed	M / Adaptation	Agriculture	Crop Cultivation	1	1	Ongoing		https://ewsdata.rightsindevelopment.org/files/documents/19/WB-P156019_sMjPzcq.pdf
Enhance paddy productivity Promote sustainable farming practices	enhancing paddy productivity, diversifying crops on marginal lands, and promoting sustainable farming practices	FAO and USAID	Ministry of Agriculture	Ministry of Agriculture, Department of Agriculture	2700 Mn	9.2 Mn	2022-2027	Grant	Disbursed	M / Adaptation	Agriculture	Crop Cultivation	1	1	Ongoing		https://www.usaid.gov/sri-lanka/press-releases/mar-19-2023-united-states-government-funded-36-000-mt-tsp-fertilizer-arrives-sri-lanka-paddy-farmers-receive-tsp-time-yala-cultivation
Health Care Waste Management Transforming Lives and	innovative gender-responsive solutions for localized HCW mngt. encouraging waste	Regional - UNDP	MoH	UNDP	104 Mn	350,000	2020-2022	Grant	Received	M	Waste, Health		1	1	Completed		

Livelihoods	producers to take responsibility.																
USAID Climate Adaptation Project	Enhancing adaptive capacities of public, private sectors & local communities to climate change impacts	Bilateral	Government, private sector and civil society	Tetra Tech ARD Inc.		8 Mn	2021 - 2026	Technical Assistance	Received	A	Agriculture, Fisheries and Tourism	Plantation, Livestock, Inland Fisheries and marine fisheries	1	1	Ongoing		
Development of self-sustained culture-based inland fisheries cluster model	bolster food security & improve rural livelihoods through enhancement of inland fisheries.	FAO	GoSL	Ministry of Fisheries and Aquatic Resources	44 Mn	150,000	2023-2025	Grant	Received	Received	Fisheries	Inland Fisheries	1	1	Ongoing		https://www.fao.org/srilanka/programmes-and-projects/project-list/ar/
Improving smallholder dairy production through the introduction of quality forage varieties	enhancing smallholder dairy farming by introducing high-quality forage varieties, improving nutrition management for better milk yield, and providing capacity-building and technical training	FAO	GoSL	Ministry of Agriculture	59 Mn	200,000	2022-2024	Grant	Received	A	Livestock	Dairy Cattle	1	1	Ongoing		https://www.fao.org/srilanka/programmes-and-projects/project-list/ar/

Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities residing in the vulnerable river basins	Focusing Knuckles Mountain Range, vital for biodiversity and water resources. Climate shifts are causing floods, landslides, and droughts, leading to erosion, sedimentation, and reduced reservoir capacity, worsening water shortages and food insecurity for smallholder farmers.	GCF	Multilateral	International Union for Conservation of Nature	MoI, ICRAF	11,900 Mn	39.8 Mn	2020 - 2026	Grant	Approved	A	Agriculture /Water	NA	1	1	Ongoing	Reduce vulnerability to climate impacts, protect livelihoods, enhance water resource management, and promote sustainable agricultural practices in these high-risk regions.
Climate Smart Irrigated Agriculture Project	Enhances productivity and climate resilience in small holder agriculture through Climate Smart Agriculture	World Bank		GoSL	MoA	42,000 Mn	140Mn	2019-2025	IBRD/IDA	Approved	A	Agriculture	NA	1	1	Ongoing	To improve agricultural productivity, increase water-use efficiency, and build climate resilience among farmers by integrating climate-smart practices and sustainable irrigation methods.
The 2 nd NDA Readiness Project:	Strengthening the capacity of DAE, NDA	GCF	GoSL	Global Water Partnership	MoE	238 Mn	0.81Mn	2021-2023	Grant	Approved	Cross Cutting				1	Ongoing	

	and GCF project programming Stakeholders																
Climate Promise Phase II: From Pledge to Impact	Supporting to develop NDC Implementation Plan including gender responsive SDG aligned plans for energy, fisheries, livestock, water sectors	Regional - UNDP	Ministry of Environment	UNDP		300,000	2022-2023	Grant	Received	Cross-cutting	All (Energy, Forestry, Transport, Agriculture, etc.)	1	Completed		Climate Promise Phase II: From Pledge to Impact		Regional - UNDP

Annex 33: Information on Technology Development and Transfer Support received

Title of activity, programme, project or other	Programme/project description	Type of technology	Time frame	Recipient entity	Implementing entity	Type of support	Sector	Subsector	Status of activity	Use, impact and estimated results	Additional information
The Renewable Energy Microgrid Pilot Project and the Smart Grid Research Laboratory	ADB support of (1.8 Mn USD) for Implementation of Microgrid Pilot Project and the LECO-UOM Smart Grid Research Lab at the University of Moratuwa	Development in the field of Smart Grids	2022	UoM	LECO	M	Energy	Energy Industry (Power), Renewable energy	Completed		The Renewable Energy Microgrid Pilot Project and the Smart Grid Research Laboratory: Opened by President, ADB University of Moratuwa
85kWp hybrid semi-transparent solar panel project	Sri Lanka's first-ever semi-transparent Solar PV powered Agrivoltaics pilot project	Hybrid semi-transparent Solar PV project	2023	MoPE, SLSEA, TSHDA	Hayleys PLC	M	Energy	Energy Industry (Power), Renewable energy	Completed		Hayleys Solar Selected for First-of-its-Kind ADB-Developed and Financed, Agrivoltaics Project in Sri Lanka
Development of Electric Vehicle (EV) Charging Infrastructure	To establish a network of public EV charging stations to promote electric vehicle adoption and reduce carbon emissions.	Electric Vehicle Charging Technology	2022	General public and EV owners	Ministry of Transport, with support from private sector partners	Initial technical support for setting up 50 public EV charging stations	Transport	Road Transport	In the initial phase with 50 stations established		-
Pilot Project for Climate-Resilient Road	Use of advanced materials to withstand	Climate-Resilient Road	2021	Local road construction agencies	Ministry of Transport, in collaboration with	Technical support for	Transport	Road Transport	Pilot phase initiated in		

Construction in Central Highlands	flooding, landslides, and high temperatures	Construction Materials			JICA and the World Bank	piloting climate-resilient materials in a selected high-risk area			the central highlands		
Real-Time Traffic and Emissions Monitoring in Colombo	To install real-time monitoring systems on key transport routes to collect traffic and emissions data.	Real-Time Traffic and Emissions Monitoring Systems	2021	MoE., CMC	MoE with support from UNDP	Technical support to implement a pilot monitoring system	Transport	Road Transport	Pilot phase initiated in Colombo		
Urban and Regional Public Transport Efficiency Project	Integrating advanced, low-emission rail and bus technologies to enhance public transport efficiency on urban and regional routes.	Fuel-efficient buses and rail infrastructure upgrades	2021	Sri Lanka Transport Board (SLTB), Ministry of Transport	ADB and JICA	Financial support for procurement and upgrades, along with technical assistance	Transport	Public Transport	Initial deployment of buses and rail upgrades underway		-
Landslide Mitigation and Early Warning System Project	To implement slope stabilization measures and establish early warning systems in landslide-prone regions, enhancing safety and resilience in vulnerable areas.	Slope stabilization techniques and landslide monitoring systems	2021	Disaster Management Center, Sri Lanka	Disaster Management Center, with support from the Global Environment Facility (GEF)	Pilot project funding and technical assistance	Transport	Road Transport	Pilot phase implemented		-

Bio gas, Biomass and Solar Trilateral Cooperation (Transitioning to Sustainable Energy Uses in the Agro-Industry Sri Lanka - China - Ethiopia)	The project supports Sri Lanka's GHG reduction targets by demonstrating biogas and solar potential in the agro-industry. Under a South-South Cooperation framework, it fosters China-Sri Lanka cooperation on renewable energy technology (RET) transfer. Expected outcomes include energy-saving hybrid systems and shared RET applications in agriculture, livestock, and fisheries.	Provision of Solar power backpack sprayer, solar powered insect trap, solar power animal repellent including training	2021	Agriculture Fisheries, Livestock Departments of 5 provinces - Uva, Southern, Northern, North Western, Eastern		M	Agriculture		Completed		
		3kW grid tiered Solar PV system in three milk chilling centers		Cargills Milk Chilling Center in Doratiyawa, Labaan Dairy (Pvt) Ltd in Palampoddu, Rasoda Dairy Chilling Center in Kalugamuwa		M	Agriculture	Livestock	Completed		
Fisheries Modernization and Resilience Project	Provide innovative fish drying and smoking technology	Fish dryer/smoker technology	2024 - 2025	Ministry of Fisheries/ NARA	NARA and ISB	A	Agriculture	Marine fisheries	on going	Climate resilience for Maldivian fish producers	
The Renewable Energy Microgrid Pilot Project and the Smart Grid Research Laboratory	ADB support of (1.8 Mn USD) for Implementation of Microgrid Pilot Project and the LECO-UOM Smart Grid Research Lab at the University of Moratuwa	Development in the field of Smart Grids	2022	UoM	LECO	M	Energy	Energy Industry (Power), Renewable energy	Completed		<u>The Renewable Energy Microgrid Pilot Project and the Smart Grid Research Laboratory: Opened by President, ADB University</u>

											of Moratuwa
85kWp hybrid semi-transparent solar panel project	Sri Lanka's first-ever semi-transparent Solar PV powered Agrivoltaics pilot project	Hybrid semi-transparent Solar PV project	2023	MoPE, SLSEA, TSHDA	Hayleys PLC	M	Energy	Energy Industry (Power), Renewable energy	Completed		Hayleys Solar Selected for First-of-its-Kind ADB-Developed and Financed, Agrivoltaics Project in Sri Lanka
Tech Boost Tourism Project			Launched by the ICTA in July 2022,	UA	ICTA, Ministry of Tourism, SLTDA, industry partners	A M Cross-cutting	Tourism	NA	UA	This project aims to empower the tourism sector with advanced technology solutions to enhance operational efficiency.	Improved technological capabilities, increased competitiveness, and sustainable practices within the tourism industry.
Digital Marketing Initiatives	UA	Digital marketing	UA	UA	E-marketing Eye, SLTDA	A.M & Cross-cutting	Tourism	NA	UA	Implemented to enhance online presence and engagement through social media campaigns and digital platforms, improving visibility for local tourism businesses.	Increased tourist engagement and awareness of Sri Lanka as a travel destination; enhanced digital footprint.

Mobile Travel Application	UA	Mobile travel app	UA	UA	World Bank, ADB, ICTA	A M Cross-cutting	Tourism	NA	UA	Enhanced visitor experience through improved access to information and services; support for community-based tourism initiatives.	
Technical assistance for the development of a self-sustained culture-based inland fisheries cluster model in Ampara district	To development of a self-sustained culture-based inland fisheries cluster model in Ampara district	Technical assistance	2023-2025	Ministry of Fisheries and Aquatic Resources/NAQDA	NAQDA	A	Fisheries	Aquaculture	on going		
Crop-animal integrated farming systems in climate vulnerable regions	NR	UA	NR	Ministry of Agriculture/Department of Agriculture	Ministry of Agriculture/Department of Agriculture	A	Agriculture	NR	Ongoing	Enhance resilience against climate change impacts, improve soil fertility, optimize resource use efficiency, and increase farm productivity, thereby supporting sustainable livelihoods for local communities	

Crop diversification with resource-efficient and climate resilient varieties for annual and perennial cropping systems	NR	UA	NR	Ministry of Agriculture/Department of Agriculture	Ministry of Agriculture/Department of Agriculture	A	Agriculture	NR	Ongoing	Expected to improve yield stability, enhance ecosystem resilience, conserve water and soil resources, and increase farmers' adaptability to climate change.	
Seasonal climate forecasting using modelling approaches and timely communication to farmers and field-level agriculture officials	NR	UA	NR	Ministry of Agriculture/Department of Agriculture	Ministry of Agriculture/Department of Agriculture	A	Agriculture	NR	Ongoing	Enhance preparedness, improve decision-making, reduce crop losses, and optimize resource allocation, thereby strengthening resilience to climate variability.	

Annex 34: Information on Capacity-building support received

Programme/project description	Time frame	Recipient entity	Implementing entity	Type of support	Sector	Subsector	Status of activity	Use, impact and estimated results	Additional information
Energy Management System (EnMS) Expert Training Programme,	2022 - 2026	Sri Lanka industry representatives	UNIDO	M	Energy	Energy Efficiency	Ongoing	Trained 140 industry representatives & individuals	https://www.industriesclimateresponse.com/
Energy System optimisation (ESO) [Steam systems, Motor systems, Compressed air systems, Pumps systems] Expert Training Programme,	2022 - 2026	Sri Lanka industry representatives	UNIDO	M	Energy	Energy Efficiency	Ongoing	Trained 50 industry representatives & individuals	
Expert training on GHG accounting and verification	2022 - 2026	Sri Lanka industry representatives	UNIDO	M	Cross-cutting	GHG Accounting	Ongoing	Trained 30 industry representatives & individuals	
The USAID Sri Lanka Energy Program, in collaboration with SAREP, held a two-day workshop on "Renewable Energy Integration and Procurement" in Colombo on March 18-19, attracting over 50 government officials.	2023		USAID/ SAREP	M	Cross-cutting	Renewable Energy	Completed		(1) Sri Lanka Energy Program: Posts LinkedIn
The first program in the series, focused on "Green Hydrogen," was held virtually from March 8–11, 2022. It was co-organized by USAID's South Asia Regional Energy Hub (SAREH) and South Asia Regional Energy Partnership (SAREP), with India's Skill Council for Green Jobs (SCGJ) as the training partner.	2022	Six SAREP countries and representing 32 organizations from government departments, research and academia, and training institutions.	USAID/ SAREP	M	Cross-cutting	Renewable Energy	Completed	66 participants (Female – 18, and Male – 48)	South Asia Energy Master Class on Green Hydrogen – SAREP

To strengthen the institutional capacity of the National Ozone Unit to meet the Sri Lanka obligation to the Montreal Protocol. Key focus of this project is to manage the staff, and activities related HPMP project and enhancing awareness on Ozone Depleting Substance for wider groups of people.	2021	National Center for Leadership Development	MOE	M	Industry		Completed	ToT on ozone awareness programme	
To phase-out Hydrochlorofluorocarbons (41b) as the blowing agent for insulation foam industry and phase-out 2.2 Metric Tons of Hydrochlorofluorocarbons used in the assembly of domestic air conditioners.	2021	Vocational Training Authority (Elipitiya, Miyagama, Kegalle), Industrial Training Authority - Katubedda	MOE	M	Industry		Completed	4 trainings on good practices in refrigeration	
		Private sector entities: Sri Lanka Private Limited, MVQ level 3 and 4 technicians, NAITA - Galle, Abans Engineering, MVTA Thalalla, Maliban Biscuits, German Tech					Completed	Training for private sector entities on good practices in refrigeration	
Provides technical training to engineers on designing and implementing resilient infrastructure that can withstand climate-related challenges.	2021	Local and regional engineers involved in infrastructure projects	Ministry of Environment, supported by the Green Climate Fund (GCF)	Technical workshops and training sessions	Transport	Road Transport	Workshops conducted for an initial group of 200 engineers	Enhance the capacity of engineers to design infrastructure resilient to climate impacts.	-
Programme offers specialized training for technicians and engineers on the installation, maintenance, and management of electric vehicle charging stations.	2021	Technicians and engineers working in EV infrastructure	Private sector partners with support from UNDP	Electric vehicle (EV) charging infrastructure	Transport	Electric Vehicles	Initial training completed for 50 technicians and engineers	Enhances local expertise in EV infrastructure, facilitating the growth of EV adoption.	
Enhancing Monitoring & Evaluation (M&E) skills for effective data collection, analysis, and	2020	Ministry of Transport, government agencies involved in emissions	UNDP, in collaboration with the	Data management software, emissions	Transport	Road, Rail, Aviation and Maritime	Ongoing workshops and sessions.	Improve data collection and analysis capabilities, resulting in better emissions reporting, policy	

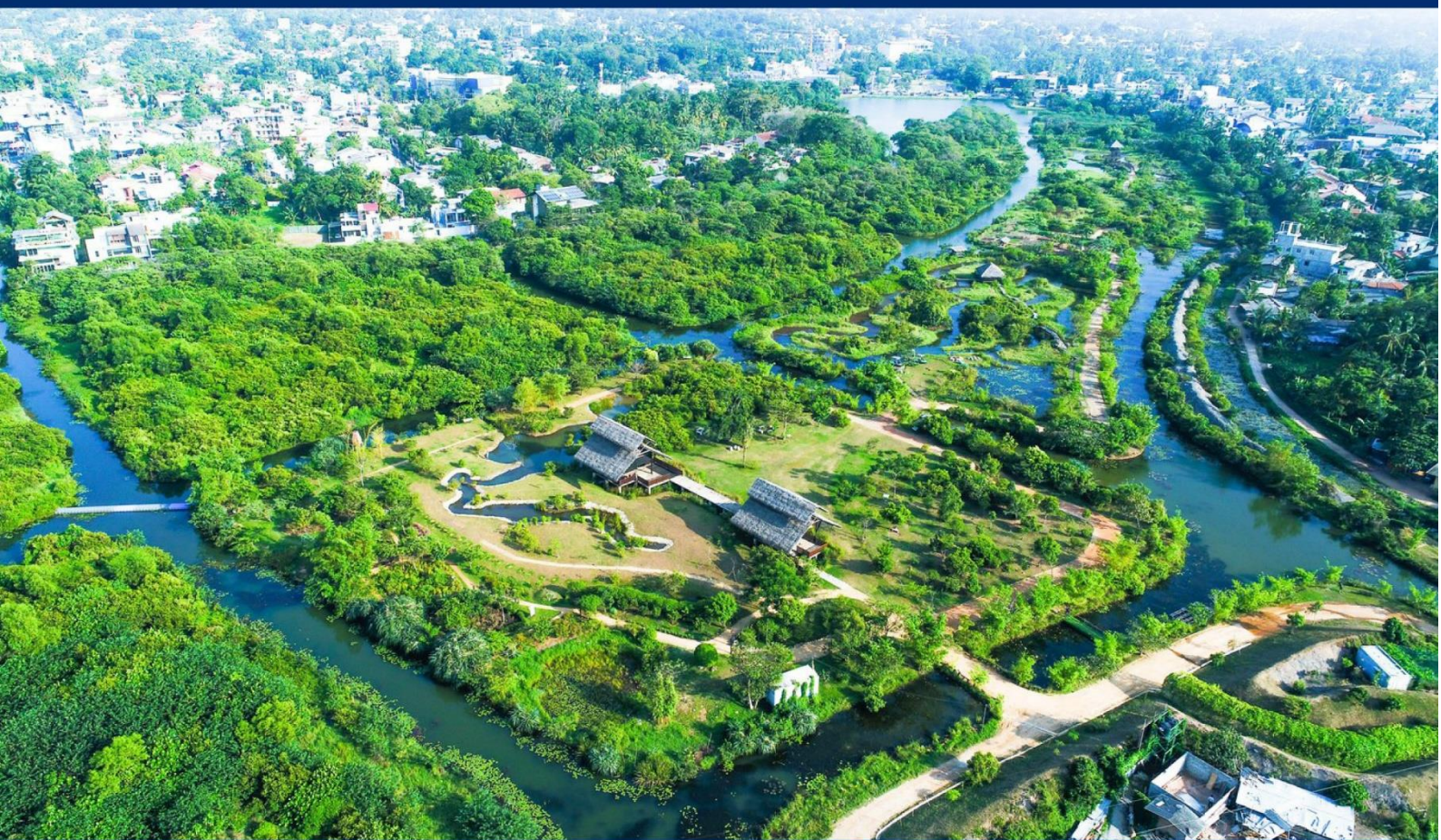
reporting in emissions tracking and data integration.		monitoring and transport.	Ministry of Transport.	monitoring tools, and integration platforms.		Transportation		development across transport sectors.	
Strengthening the development of climate adaptation policies and integrating climate resilience into planning processes at the local government level.	2020	Local government authorities and policy makers involved in climate adaptation.	GEF, in collaboration with the Ministry of Environment.	Training workshops focused on policy development for climate resilience and adaptation planning.	Transport	Road, Rail, Aviation and Maritime Transportation	Training ongoing to enhance local capacities.	Local authorities with the skills to create and implement policies that improve climate resilience.	-
Enhance disaster response and recovery capabilities in the transport sector, focusing on local agencies' preparedness for transport disruptions during disasters.	2021	Local disaster management agencies, transport authorities, and related stakeholders.	Disaster Management Center, in collaboration with the World Bank.	Disaster simulation software, transport sector recovery models, and response coordination tools.	Transport	Road Transport and Railway Transport	Initiated training sessions and disaster simulations.	Local agencies improve their disaster preparedness and response, reducing transport sector disruptions during disasters.	-
To enable community-based organizations to take collective action for adaptive landscape management for socio-ecological resilience through design, implementation, and evaluation of grant projects for global environmental benefits and local sustainable development in three ecologically sensitive landscapes	2021	SGP grantees from the three landscapes	UNDP	Cross-cutting	Crosscutting		Completed	Social enterprise awareness programme for SGP funded CBOs in the three landscapes to create awareness and incorporate these concepts into CBOs	
		Women's groups In Wilgamuwa	UNDP	A	Agriculture		Completed	Technical training on food processing technology	
		25 SGP grantee participants	UNDP	A	Agriculture		Completed	ToT on Farmer Field School	
		SGP women grantees	UNDP	Cross-cutting	Crosscutting		Completed	Capacity building training for women entrepreneurs championing environment and social sustainability	
Strengthens Sri Lanka's capacities for measurement, reporting and verification (MRV) in the AFOLU Sector in order to help Sri Lanka to meet its commitments associated with the ETF	2023-2025	Ministry of Environment	FAO Sri Lanka	Cross-cutting	Agriculture, Forestry and Other Lands		Ongoing		This project will help to close these gaps requires addressing important barriers to support the transition to ETF, technological and technical capacities for mitigation and A related activities.

for the Paris Agreement under the UNFCCC.									
Climate smart financial product development and investments in data driven climate solutions	2023 - 2026	Alliance Finance, SDB, Union bank, LIIN and DFCC	Alliance Finance, SDB, Union bank, LIIN and DFCC	A	Cross cutting	climate financing	on going		
Use of weather data and climate data to develop customized crop advisories	2023 - 2026	DoA, DAD, private sector and provincial agriculture entities	DoA, DAD, private sector and provincial agriculture entities	A	Agriculture		on going		
Awareness, access to climate financing, climate data management and implementation of activities under PAP	2024 - 2026	Uva, Eastern and Northwestern Provincial Councils	Provincial Climate Units and Boards	A	Agriculture, Fisheries, tourism and cross cutting		on going		
Innovating solutions: Bamboo Green Houses, Climate Resilient Villages	2023 - 2026	Private sector and civil society	Private sector and civil society	A	Agriculture and Fisheries		ongoing		
Support to develop NDC Implementation Plan for NDC 2.0 including developing gender responsive SDG aligned plans for energy, fisheries, livestock, water sectors. Develop 2050 Carbon Net Zero Roadmap & Strategic Action Plan	2022	GoSL	UNDP	Cross-cutting	Cross-cutting		Completed	Trainings for Govt. officers from 6 six mitigation sectors to enhance monitoring and implementation of 2050 carbon net zero roadmap & strategic plan	Support to develop NDC Implementation Plan for NDC 2.0 including developing gender responsive SDG aligned plans for energy, fisheries, livestock, water sectors. Develop 2050 Carbon Net Zero Roadmap & Strategic Action Plan

Annex 35: Information on support received for transparency-related activities, including for transparency-related capacity-building

Exchange rate used: USD 1 = LKR 293

Title of activity, programme, project or other	Objectives and description	Time frame	Recipient entity	Channel	Amount		Status of activity	Expected use, impact and estimated results	Additional information
					Domestic currency	USD			
CBIT Project	To enhance the country's capacity to meet transparency requirement under the Paris Agreement by strengthening its GHG inventory system and monitoring capabilities	2022 - 2025	FAO	Multilateral	25.3 Mn	86.3 Mn	Ongoing	Establishment of an Enhanced Transparency Framework and capacity buildings for estimation of GHGs emission and removals, adaptation measures and vulnerability, Development of MRV Protocols and National ETF Monitoring Roadmap	



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