



**National Strategic Action Plan for
Conservation and Sustainable Utilization
of Mangrove Ecosystems in
Sri Lanka
2022-2026**

Biodiversity Secretariat
Ministry of Environment



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This action plan has been prepared in line with the National Policy on Conservation and Sustainable Utilization of Mangrove Ecosystems in Sri Lanka (January 2020)

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Nationwide support for healthy mangrove ecosystems with rich biodiversity



The National Policy Framework “Vistas of Prosperity and Splendour” of the present government has introduced 10 key policies aimed at achieving the fourfold outcome of a productive citizenry, a contented family, a disciplined and just society and a prosperous nation. Chapter 8 (Sustainable Environmental Policy) of the “Vistas of Prosperity and Splendour ” has been clearly mentioned that achieving sustainable development through balanced social, economic and environmental practices. Accordingly, it is the responsibility of all citizens of the country for preserving the diverse ecosystems that exist in the country for our future generations.

As an island nation, Sri Lanka has a long coast line, and mangrove ecosystem is one of the main ecosystems found in the country’s coastal areas. Mangroves play an important role on the activities of inhabitants in tropical and sub-tropical coastal areas. It contributes towards all ecosystem services - provisioning, regulatory, supportive and cultural services. Mangroves in Sri Lanka have been destroyed as a result of human settlements, industrial activities, tourism, agriculture etc. The discharge of toxic substances and polluted water into lagoons, estuaries has an adverse impact on the living environment of mangrove species. The destruction of mangroves has had a direct and indirect influence on the livelihood of the people and the survival of wild-life. Therefore, an increased public awareness of the significance of mangroves is of utmost importance for conservation and management of mangrove ecosystems.

This plan highlights the issues pertaining to mangrove ecosystems and appropriate measures towards to conservation and sustainable use of mangrove ecosystems in Sri Lanka. Preparation of this document is to a great extent assisted by the members of the National Expert Committee on Mangrove Conservation and Sustainable Use, members of the Task Force for the Restoration of Mangroves, officials of relevant government and corporate sector institutions, academic, private sector and non - governmental organizations. I greatly appreciate all of them for their invaluable contributions.

I hope this document will support for the survival of healthy mangrove ecosystems with rich biodiversity in Sri Lanka.

Mahinda Amaraweera

Hon. Minister of Environment



Strategic actions towards better management of mangroves

Countries that harbour mangrove ecosystems have arisen to the target of protecting the immeasurable services derived from this ecosystem. Sri Lanka is no exception, and in fact now leads the Commonwealth countries as the champion of Mangrove Action Group. Sri Lanka has been working with its members to identify the priorities of actions, set innovative finances that can trigger conservation and sustainable use, develop enabling policies and instigate data governance for informed decision making.

Biodiversity Secretariat of the Ministry of Environment appointed the National Expert Committee on Mangrove Conservation and Sustainable Use in 2015 and under the guidance of this committee the National Policy on Conservation and Sustainable Utilization of Mangrove Ecosystems in Sri Lanka was developed and received the cabinet approval in 2020. Backed by the science and policy, better management of mangroves is now possible, and it is vital for economic and social revival of coastal communities and good governance.

At present mangroves are present in both government and private lands. Identified as ecosystems with incomparable value by the policy, Sri Lanka needs to move forward with implementing the strategies outlined in the policy with government, non-government and with the public. This National Strategic Action Plan elaborates various platforms available and needs to be built in, to move forward and to engage further.

The actions outlined here are mapped to SDGs, Sri Lanka is signatory to and wish to ensure that these targets are achieved as agreed through the implementation of this action plan. The primary and secondary responsible agency for each action has been outlined. Each agency is accordingly requested to include these actions to their respective annual plans and invest accordingly. Additionally, this action plan also invites investors, well-wishers and other donors to engage with relevant institutions and ensure policy goals are achieved.

My special thanks goes to Prof. Sevvandi Jayakody, Chair Professor, Wayamba University of Sri Lanka, who was instrumental in preparing this National Strategic Action Plan, for providing her expertise and her commitment to successfully complete this task. Also I wish to thank all the members of the National Expert Committee on Mangrove Conservation and Sustainable Use, members of the Task Force for the Restoration of Mangroves, all officials from government, private and non-governmental organizations and individuals for their fullest support to complete this national endeavour. My sincere appreciation is extended to Director, and relevant other officials of the Biodiversity Secretariat who made this publication possible.

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Abbreviations

AGD	Attorney General's Department
BASL	Bar Association of Sri Lanka
BDS	Biodiversity Secretariat
CBD	Convention on Biological Diversity
CBOs	Community Based Organizations
CC& CRM	Department of Coast Conservation & Coastal Resource Management
CCA	Coast Conservation Act
CEA	Central Environmental Authority
CSIRO	Commonwealth Science and Industrial Research Organization
CSD	Civil Security Department
DAD	Department of Agrarian Development
DNBG	Department of National Botanic Gardens
DCC	District Co-ordinating Committee
DFAR	Department of Fisheries and Aquatic Resources
Dis.S	District Secretariat
DoSS	Department of Social Services
DS	Divisional Secretariat
DWC	Department of Wildlife Conservation
FA	Fisheries Act
FD	Forest Department
FFPO	Fauna and Flora Protection Ordinance
FM	Foreign Ministry
INGOs	International Non Governmental Organizations
IORA	Indian Ocean Rim Association
LUPPD	Land Use and Policy Planning Department
M & E	Monitoring and Evaluation
MELAG	Mangrove Ecosystem and Livelihood Action Group
MEPA	Marine Environment Protection Authority
MoE	Ministry of Environment
MoEd	Ministry of Education

MoF	Ministry of Finance
MoFAR	Ministry of Fisheries and Aquatic Resources Development
MoI	Ministry of Industries
MoJ	Ministry of Justice
MoST	Ministry of Science and Technology
MoT	Ministry of Tourism
MoTec	Ministry of Technology
MoU	Memorandum of Understanding
NAQDA	National Aquaculture Development Authority
NARA	National Aquatic Resources Research and Development Agency
NEC	National Expert Committee on Mangrove Conservation and Sustainable Use
NEDA	National Enterprise Development Authority
NGOs	Non Governmental Organizations
NIE	National Institute of Education
NPD	Department of National Planning
NRC	National Research Council
NSF	National Science Foundation
NWP	North Western Province
NWPEA	North Western Provincial Environmental Authority
NWSDB	National Water Supply and Drainage Board
OA, E & CC	Ocean Affairs, Environment & Climate Change
RLE	Red Listing of Ecosystems
SDGs	Sustainable Development Goals
S LSD	Sri Lanka Survey Department
SLIATE	Sri Lanka Institute of Advanced Technological Education
SLN	Sri Lanka Navy
SLTDA	Sri Lanka Tourism Development Authority
SLP	Sri Lanka Police
SME	Small and Medium Enterprises
SMEDA	Small and Medium Enterprises Development Authority
TF	Task Force for the Restoration of Mangroves
UGC	University Grants Commission

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@ Sevwandi Jayakody

Mangroves, salt marshes and seagrass lock away carbon at up to five times the rate of tropical forests

1. Introduction

1.1 Background

Amongst different ecosystems in Sri Lanka, mangroves represents a unique assemblage of specialized fauna and flora adapted to survive in brackish water conditions and intertidal zones. As per the estimates of Department of Forests (2010), 15,669 hectares of Sri Lanka is covered with mangroves. In Sri Lanka, about 21 true mangrove and several mangrove associated flora have been identified. Most importantly, this represents one third of the world mangrove species diversity.



Mangroves perform a crucial role in maintaining the ecological integrity of the coastal zone, and the services provided are provisioning, regulatory, supportive as well as cultural. Being in between coastal and inland ecosystems, they act as filters from both sides. From the landward side, upland sediment and other organic and inorganic matter uploads are deposited within mangrove ecosystems, preventing direct release of sediments and nutrients to sensitive coastal ecosystems such as seagrass beds and coral reefs. From seaward side, effects of tides, storm surges, tsunamis and salt wedges to freshwater ecosystems are ameliorated hence; salt

water sensitive ecosystems, lives of people and their properties are protected. Additionally, the role played by mangrove ecosystems as carbon sinks, that absorbs greenhouse gases thereby mitigating adverse climate change impacts is globally highlighted as a prime need for conserving mangroves. Biologically, mangrove ecosystems provide feeding and breeding habitats for species that permanently inhabit such ecosystems as well as for those temporarily immigrate as a part of their life cycle requirements. Economically, mangroves provide livelihood opportunities for the coastal populations through fisheries and ecotourism opportunities. The fish, shellfish and other food items obtained from mangroves play a vital role in food and nutritional security of the coastal communities.



These essential services, however, are being hampered through indiscriminate cutting, land grab, conversion of mangrove swamps to aquaculture systems and salterns, less interest/unawareness, ownerships, increase in freshwater intrusion through water diversion and irrigation projects, reclamation projects and other

coastal developments. These threats result in habitat fragmentation and deterioration, leading to loss of species, ecosystem functions/dynamics and services. Also, increased levels of inorganic and organic additions from agriculture related fertilizer and pesticides and organic compounds from untreated sewage disposal have accelerated nutrient pollution in mangrove ecosystems. Additionally, material both from natural and xenobiotic sources have caused both solid waste problems and health hazards. As the mangroves cover less than 0.1% of land area of Sri Lanka, it is a timely need, locally and globally to fast-track the implementation of the national policy on mangroves to conserve and sustainably use this ecosystem maintaining the quality of mangroves ecosystems to harness multiple benefits described.

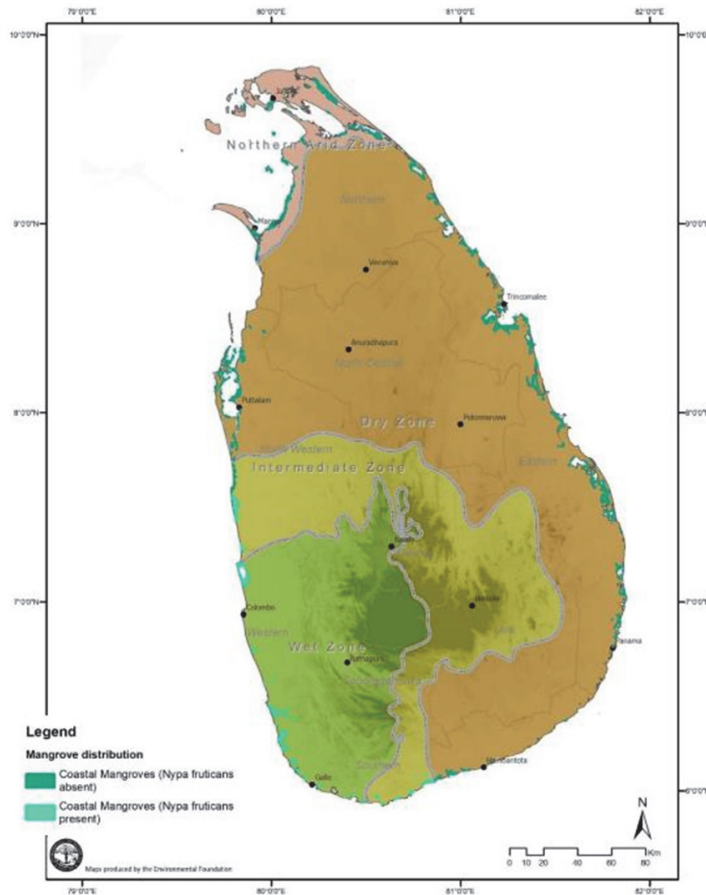


Figure 1: Current distribution of mangroves and zonation [© MoE (2019), 6th National Report to CBD]

Overarching legal and policy frameworks that support and provide the enabling conditions for effective mangrove management should be vital for good management of mangroves and influential areas. The management frameworks based on such policy and legislation for mangroves at the national level, should ensure that laws and regulations are enacted and enforced while clearly defining the rights of ownership, access and rational use of mangrove forests, enhance human, technical, legal and financial capacity for mangrove management at different levels. These legal approaches should also ensure that subsidies and other incentives and initiatives including restoration/rehabilitation that lead to mangrove degradation or loss, are removed. Although limited provisions are present in current policies regarding mangroves, a cohesive, purpose driven, and mangrove ecosystem focused action plan is absent.

Additionally, co-ordinated action towards the protection and restoration of mangroves needs to be main-streamed within planning structures and actions, notably under biodiversity, wetlands, sustainable land management and climate change adaptation. Further, the mangrove conservation and management is in line with the UN Framework Convention on Climate Change, Sendai Framework for Disaster Risk Reduction and Ramsar Convention, Commonwealth Blue Charter (MELAG - Mangrove Ecosystems and Livelihood Action Group) for which Sri Lanka is signatory.

The following action plan has been formulated considering the goals and strategic objectives proposed by the national policy on conservation and sustainable use of mangroves. Further, the analysis conducted for preparation of the 6th National Report on Sri Lanka to CBD highlighted several challenges that need attention as highlighted below.

2. Threat analysis

Physical disappearance: Sri Lanka is rapidly losing mangroves, due to multiple, interconnected threats. The fact these ecosystems are edaphically, physio-chemically, economically and ecologically interconnected has been ignored in the planning of recent development projects, in particular the development of aquaculture in the country. Aquaculture development, encroachment, land acquisition and alteration of mangrove habitats for settlement, small industries and agriculture purposes is a major cause of habitat loss. The growth in prawn farms since early 1980's has resulted in a significant loss of mangrove cover, especially in the North Western and Eastern provinces. In recent years, salt marshes as well as mangroves are threatened by increasing, and clearance for salterns in Puttalam.

Pollution: Pollution is another major threat to mangrove ecosystems. This includes indiscriminate additions of solid waste and related leachate, industrial and urban effluent discharges and agricultural run-off. This problem is particularly acute in areas with high population density, such as the west and south coast. Further, the Sri Lanka river system also brings pollutants from inland urban, industrial and agricultural sources to the coastal area.

Solid waste accumulation: Accumulation of solid waste and substantial pollution of brackish water in estuaries is another critical threat to all coastal habitats. At present estuaries in Negombo and Chilaw are badly affected from pollutants. Compounding matters is that long-shore currents periodically bring solid waste from trans-boundary countries further worsening the situation.

River diversion and developments: Mangroves are also affected by river diversions and development activities that change river flow rates and volume. This can result in a change in salinity levels, and a change in environmental conditions for an example the excess irrigation water from Lunugamwehera and Bandagiriya systems to Bundala Lagoon and National Park. Attempts in the Northern Province to

construct barriers to stop salt-water intrusion into lagoons can also be viewed as a threat to mangroves.

Climate change: Climate change may pose significant risks to mangroves, seagrasses and salt marshes due to potential variations in water temperature, rainfall patterns, ocean acidification and increased storm events.

3. Extracts from Policy

Vision

A healthy mangrove ecosystem with rich biodiversity supporting the nation with direct and indirect services.

Policy statements

1. Ensure recognition of mangrove ecosystems as entities of “incomparable” values.
2. Encourage prioritization in allocation of economical and social resources for mangrove conservation without consideration of direct or immediate economic benefits.
3. Establish consideration of mangrove ecosystems as state properties irrespective to land ownership thus ensuring same legal protection and habitat management.
4. Encourage liberation of mangrove ecosystems from illegal settlements and developments and prevention of further land encroachment.
5. Recognize the importance of periodical update of the extent of mangrove cover, flora and fauna and their population dynamics as well as genetic diversity.
6. Encourage intra and inter institutional linkages for the conservation and sustainable utilization of mangroves as well as for collecting and sharing information.
7. Encourage public and private partnerships in managing mangrove ecosystems and promotion of mutually beneficial systems.
8. Ensure maintenance and improvement of natural water flow and water quality in mangrove ecosystems.

9. Safeguard the dependencies of humans for services provided by mangrove ecosystems and ensure their viability and availability inter and intra generationally.
10. Encourage stakeholders to promote the plantation of the correct species of mangroves.
11. Ensure, further development of the voluntary mangrove carbon market and other sources of investment that reflect carbon credentials and wider public benefits to deliver a landscape with more mangroves.
12. Publicize the conservation of mangroves through awareness, empowerment of stakeholders and reduction of dependencies that threaten sustainability.
13. Ensure the health of mangrove ecosystems by recognizing the importance of maintaining by preventing the entry of dissolved organic and inorganic pollutants, suspended solids, solid wastage and toxic gases to water soil and air.
14. Promote environmental offsetting and restoration of degraded mangrove ecosystems with the aim of rebuilding lost environmental services with scientifically sound techniques.
15. Ensure the right of access to mangrove ecosystems for its aesthetic beauty in the right manners that does not jeopardize mangroves and their functions.
16. Recognize the right to sustainable development with environmental protection being constituted as an integral part of development in mangrove ecosystems, and ensure application of all environmental impact assessments irrespective of the size and nature of the development.
17. Ensure necessary actions as a precautionary approach when credible information is present, regarding threats and irreversible damages to mangrove ecosystems regardless of scientific data.
18. Ensure financial, timely and logistical support for research on developing tools, methods/technologies to conserve, restore and for sustainable use and to establish status of ecosystems for a scientifically backed decision processes.
19. Warrant international co-operation to conserve and sustainably manage mangroves to develop human and physical capacities.

4. Goals and Strategic Objectives

The Strategic Objectives have been prepared based on the 6 Strategies identified in the national policy

Table 1: Goals and strategic objectives

Goals	1. Human and ecological well-being in areas where mangroves are present is established through good governance and mangrove ecosystems including living and non-living resources as well as their interactions are optimally functioning through conservation	2. Concerns regarding mangrove ecosystems are applied into policies, legislation, plans, programmes and projects through which efficient resource use is established minimizing adverse environmental impacts in mangrove ecosystems	3. Traditional knowledge is protected and social capital for mangrove conservation is empowered through mutually beneficial multi-stakeholder partnerships between local communities, public agencies, the academic and research community, investors, and multilateral and bilateral development partners hence equitable access to mangrove ecosystems inter and intra generationally is established	4. A nationwide support for mangrove conservation is formed through awareness among both resource users and general public
Strategic Objectives	<p>1.1 Develop regulatory reforms to the legislative framework and regulations of stakeholder agencies</p> <p>1.2 Establish mangrove conservation, restoration and expansion frameworks and execute with inter agency participation</p>	<p>2.1 Establish enabling regulations, action plans and financial mechanisms</p> <p>2.2 Establish rigid M and E strategies with measurable, benchmarked indicators for monitoring the health of mangrove ecosystems</p>	<p>3.1 Improved access to data through establishment of a database with access and continuous updating</p> <p>3.2 Create institutional mechanisms for key stakeholder participation in mangrove management</p>	<p>4.1 Implement focused awareness to all levels of stakeholders from policy makers to grass root communities</p> <p>4.2 Conduct causal analysis and identify most significant and important threats and issues</p>

5. Strategic Action Plan

Table 2: Strategic objectives, activities, responsible agencies and indicators of goal 01 (* denotes any action that is already in progress)

Goal 01: Human and ecological well-being in areas where mangroves are present is established through good governance and mangrove ecosystems including living and non-living resources as well as their interactions are optimally functioning through conservation		Strategic Objective 1.1 : Develop regulatory reforms to the legislative framework and regulations of stakeholder agencies								
No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
1.1.1	Establish National Expert Committee on Mangrove Conservation and Sustainable Use and conduct periodic meetings*	Minutes of regular meetings	BDS of MoE	CEA, MoFAR CC & CRM, DWC, Forest and other provincial level officers, MEPA, NARA, NAQDA, Academia, SLN, NGO+INGO's						0.5
1.1.2	Establish an inter-ministerial / institutions committee to review relevant policies and legislations and conduct a gap analysis to introduce regulatory reforms to relevant legislations to be in line with the provisions of the policy*	Report of recommendations to relevant agencies for amendments	BDS of MoE	FD, DWC, CEA, DFAR, LUPPD, CC& CRM, AGD, Academia						0.2

Strategic Objective 1.1: Contd.										
No.	Activity	Indicators	Key responsible agency	Other Agency/ies	2022	2023	2024	2025	2026	Budget
1.1.3	Amend the existing legal provisions and introduce new where necessary by each agency to be in line with policy.	Reforms adopted / new regulations to relevant legislations	Institution/s to be decided after	AGD, LD						0.05
1.1.4	Create necessary awareness on regulatory reforms and existing provisions with the support of NEC, TF and BASL	Number of awareness sessions	1.1.2 MoE, Media Centre for National Development	Ministry of Mass Media, CEA, DS, DCC, Grama Niladhari						1.5
1.1.5	Create necessary awareness on regulatory reforms and existing provisions of Forest Ordinance under their purview	Number of awareness sessions	FD	DS, DCC, Grama Niladhari						0.5
1.1.6	Create necessary awareness on regulatory reforms and existing provisions of FFPO under their purview	Number of awareness sessions	DWC	DS, Grama Niladhari, DCC						0.5
1.1.7	Create necessary awareness on regulatory reforms and existing provisions of CCA under their purview	Number of awareness sessions	CC & CRM	DS, Grama Niladhari, DCC						0.5
1.1.8	Facilitate implementation of regulatory reforms and existing provisions of FFPO and FA	Number of successful law implementations	MoE, DWC, DFAR	Dis.S, DS, CEA						2.5

Strategic Objective 1.1 : Contd.

No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
1.1.9	Introduce necessary regulatory reforms to EIA and IEE provisions to implement policy statement 16	Amended and gazetted regulations	MOE, CEA,							N.A
1.1.10	Enhance legal protection to mangroves that are currently unprotected and requires to be managed as identified by FD, DWC, CC & CRM	Ha of new area gazetted as PA Area under co-management plans	FD,DWC,CC & CRM	MoJ, Dis.S, DS,CEA						37.5
1.1.11	Use the platform of TF to agree on areas that can have greater protection and management by collaboratively declaring as PA	Ha of new areas gazetted as PA	TF	DWC, FD, CEA, CC & CRM						2

Strategic Objective 1.2 : Establish mangrove conservation, restoration and expansion frameworks and execute with inter agency participation

No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
1.2.1	Establish National Mangrove Task force for the restoration/ rehabilitation/ conservation of mangrove ecosystems in Sri Lanka and conduct periodic meetings *	Periodic minutes of the meeting	MoE	MoFAR, CC & CRM, DWC, CEA, Forest and other provincial level officers, FM, MEPA,NARA, NAQDA, Academia, NGO+INGO's						0.1

Strategic Objective 1.2: Contd.							
No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	
					2024	2025	2026
					Budget		
1.2.2	Establish criteria to identify mangrove and their edge ecosystems and demarcate all mangrove ecosystems of the country with ground truthing and produce national mangrove data base and maps*	Data base up and running Maps	FD	DWC, SD, LUPPD, DS			125
1.2.3	Conduct research on species diversity, ecosystem functioning and dynamics, ecosystem services, economic value, impacts of climate change and other threats, and potential of key mangrove areas and conduct yearly reviews on research priorities by Mangrove Experts Committee	Number of publications Symposia presentations Reports	MoE, Ministry responsible for Science Technology and Research	DWC, FD, CEA, CC & CRM, DNBG INGO/NGO/Commonwealth Blue Charter Action group on Mangroves with FM, NSF, NRC, Research Institute, Academia, IUCN+NGO			20
1.2.4	Conduct RLE on selected mangrove ecosystems	Number of sites with known RLE category	MoE, Ministry responsible for Science Technology & Research	DWC, FD, CEA, CC & CRM, DNBG IUCN/NGO/Commonwealth Blue Charter, Research Institutes, Academia			5

Strategic Objective 1.2: Contd.										
No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
1.2.5	Establish national mangrove information database	Data base up and running	MoE	MoF, MoTec, FD, DWC, NEC, TF National Herbarium National Museum Academia Other relevant stakeholders						1
1.2.6	Identify the encroachments and take legal action in any mangrove area and associated wetlands	Maps of encroachment	FD, DWC	CC & CRM, DS,						2
1.2.7	Establish government-private mangrove management partnerships*	Number of MoU signed	FD, DWC, CC & CRM	National and international agencies, communities, investors and donors						0.5
1.2.8	Implement guidelines for effective restoration and formulate an adopting strategy to comply with guidelines	Published guidelines and strategy	MoE with the support of NEC, TF	NGO, Academia						0.5
1.2.9	Print and distribute information on restoration and nursery management *	Publication/s	MoE with the support of NEC, TF	FD, DWC, SL Navy, CC&CRM, Academia NGO/INGO Mangrove Blue Charter						1

Strategic Objective 1.2: Contd.										
No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
1.2.10	Initiate mangrove restoration pilot projects	Number of successful sites	TF	FD, CC & CRM, DWC, Dis.S., MEPA, CEA, SLN, NGO/INGO Research institutions and researchers, Academia						75
1.2.11	Introduce sustainable livelihoods around restoration projects and provide training and infra-structure	Number of initiatives	SMEDA	FM, CBOs, MELAG under the Commonwealth Blue Charter, Dis.S						25
1.2.12	Identify potential areas for further expansion of mangroves*	Area identified	FD, DWC, CC & CRM	Dis.S, LUPPD, SLSD						6
1.2.13	Initiate an awareness and motivation campaign to reorient career expectations of communities living in mangrove ecosystems to sustainably utilise the services for economic gains	Number of awareness programme Number of new businesses	MoE, CC& CRM, DoFAR	Dis.S, MEPA, DCC, CEA, FD, NWPEA						4
1.2.14	Initiate co management initiatives and SME focusing on sustainable utilization of direct and indirect services	Number of new/reoriented businesses	SMEDA, DoFAR	District Secretariats						2

Strategic Objective 1.2: Contd.										
No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
1.2.15	Address direct and indirect threats to already protected mangrove ecosystems through stakeholder engagement, advocacy and by implementation of site-specific plans	Number of management plans successfully adopted	DWC, DoFAR	Divisional Secretariats,CEA, INGO+NGO						N.A
1.2.16	Establish successful propagation methods for true mangrove flora and train relevant agencies on nursery management* Post nursery management and care (1.2.8)	Number of seedlings raised per year	FD	Academia, DNBG NGOs and CBOs						6
1.2.17	Initiate global dialogues and partnerships	Number of initiatives	FM	CBOs, IOIRA, CSIRO based in Australia, Academia and NGO						N.A

Table 3: Strategic objectives, activities, responsible agencies and indicators of goal (* denotes any action that is already in progress)

Goal 02: Concerns regarding mangrove ecosystems are applied into policies, legislation, plans, programmes and projects through which efficient resource use is established minimizing adverse environmental impacts in mangrove ecosystems										
Strategic Objective 2.1: Establish enabling regulations, action plans and financial mechanisms										
No.	Activity	Indicators	Key responsible agency	Other agencies	2022	2023	2024	2025	2026	Budget
2.1.1	Develop and implement co-management plans for at least 3 selected mangrove ecosystems	Number of co-management plans	FD, CC & CRM, DWC	District Secretariats, local CBOs, Research Institutes and Academic Institutes						10
2.1.2	Establish mangrove bio finance mechanisms and introduce to relevant agencies	Number of investors and MoUs	MoE	CC & CRM, DWC, MEPA, FD, SLN, (OA, E&CC) of the FM						0.5
2.1.3	Conduct workshops for Institutional development and capacity building of stakeholders	Number of institutions and participants successfully trained	BDS of MoE	All identified stakeholders						1
2.1.4	Conduct capacity building workshops for regulatory institutions	Number of institutions and participants successfully trained	BDS of MoE	CC & CRM, DWC, Dis.S, MEPA, , FD, CEA						1

Strategic Objective 2.1: Contd.

No.	Activity	Indicators	Key responsible agency	Other agencies	2022	2023	2024	2025	2026	Budget
2.1.5	Establish and maintain a mangrove crime reporting system (portal)	Number of cases dealt through portal	BDS of MoE,	FD DWC, CC & CRM, NGOs & CBOs, SLP						2
2.1.6	Establish "Seeds for Needs" carbon funds and benefit sharing mechanisms	Approved mechanism Number of initiatives	BDS of MoE	MoF, NPD, (OA, E&CC) of the FM						N.A
2.1.7	Establishment of an interactive website linked to the GIS database (1.2.5) for participatory acquisition of information, discussion of development topics, promoting awareness on land assets and development opportunities, and building community awareness	Website Number of hits	BDS of MoE	CC & CRM, DWC, MEPA, FD, SLN, Academic and Research Institutions						N.A
2.1.8	Promote public awareness campaigns, among coastal communities, on development opportunities to enable group organization, activism and lobbying to establish dialogue to conserve and utilise the services	Number of campaigns Number of public initiatives	BDS of MoE	CC & CRM, DWC, District Secretariat, MEPA, FD, NGOs, CBOs						1.5

Strategic Objective 2.1: Contd.....

No.	Activity	Indicators	No.	Activity	Year					Budget
					2022	2023	2024	2025	2026	
2.1.9	Initiate training programmes for imparting skills in ecosystem-based planning and adaptive management	Number of participants successfully trained Number of plans prepared and executed	BDS of MoE	CC & CRM, Academia, Researchers						0.5
2.1.10	Initiate training programmes for imparting skills in ecosystem-based planning and adaptive management, including international collaborations	Number of participants successfully trained	(OA, E&CC) of the FM	FD,DWC, MEPA, NARA, NAQDA, CC & CRM, Academia & Researchers						5
2.1.11	Establish and implement a funding mechanism to support business entities to comply with environmental standards related to mangroves, in collaboration with the respective business chambers, and international collaboration	Number of funding initiatives	MOE, (OA, E&CC) of the FM	MoF, Dis.S Chamber of commerce, CEA, Public and Private Banks						-

Strategic Objective 2.2: Establish rigid M and E strategies with measurable, benchmarked indicators for monitoring the health of mangrove ecosystems

No.	Activity	Indicators	Key responsible agency	Other agencies	Year					Budget
					2022	2023	2024	2025	2026	
2.2.1	Conduct studies to identify indicator species of change in mangroves	No. of reports and research articles	BDS of MoE,	CC & CRM, FD, DWC, NGOs, Academia						10
2.2.2	Establish carbon stocks, and oxygen emitting capacity in selected mangrove ecosystems	No. of reports and research articles	FD, NARA, Academia	CC & CRM, DWC, SLN Investors						10
2.2.3	Study the hydrography, sedimentation and transportation of selected mangrove ecosystems and fix data loggers	Number of mangrove sites with data loggers	NARA, Academia	FD, DFAR, DWC, CEA, SLN, Private sector Organizations						10
2.2.4	Establish and maintain mechanisms to monitor seasonal variations in water quality in selected mangrove ecosystems	Number of sites monitored	NARA, MEPA, Academia	CEA, FD, DWC, CC & CRM, MEPA						4
2.2.5	Identify the strength of socio-economic dependencies in selected mangrove ecosystems	Number of studies conducted	NAQDA, DoSS, FD	Dis.S, Academia NGOs, DWC, CC & CRM, MEPA, LUPPD						10
2.2.6	Conduct pilot level projects in restored abandoned shrimp farms and saltrens to establish indicators that can be used to measure success.*	Number of projects conducted	FD, DWC	Academia NARA NAQDA Investors						0.2
2.2.7	Implement fisheries management plans in selected estuaries	Number of management plans implemented	DFAR	NAQDA, CC & CRM, NARA, FD, DWC, DS						5

Table 4: Strategic objectives, activities, responsible agencies and indicators of goal 03 (* denotes any action that is already in progress)

<p>Goal 3: Traditional knowledge is protected and social capital for mangrove conservation is empowered through mutually beneficial multi-stakeholder partnerships between local communities, public agencies, the academic and research community, investors, non-government agencies and multilateral and bilateral development partners hence equitable access to mangrove ecosystems inter and intra generationally is established</p>										
<p>Strategic Objective 3.1: Improved access to data through establishment of a database with access and continuous updating</p>										
No.	Activity	Indicators	Key responsible agency	Other agencies	2022	2023	2024	2025	2026	Budget
3.1.1	Document all conventional wisdom, practices associated with mangroves nationally and internationally	Final report printed and distributed	MoE	CC & CRM, FM- OA, E & CC, NRC, NSF Academia, NGO/INGO						0.3
3.1.2	Collate and upload all mangrove literature including traditional practices for decision making purposes into a central literature repository	Repository Number of users	MoE	NSF, NRC,						N.A
3.1.3	Promote indigenous and technical knowledge in coastal management, development and cleanliness and advocate to public including school children.	Number of practices included Number of meeting held	CC & CRM	MoEd, CEA						1.5
3.1.4	Ground truth the boundaries of all mangrove patches and develop a database (see 1.2.2)	No. of hectares Ground truthed	DoSS	LUPPD, FD, DWC						1

Strategic Objective 3.1: Contd.										
No.	Activity	Indicators	Key responsible agency	Other agencies	2022	2023	2024	2025	2026	Budget
3.1.5	Establish a directory of all stakeholders in mangrove related action*	Directory	MoE	FD, DWC, NGO+INGO, Academia						N.A
3.1.6	Establishment of an interactive website* (Please refer footnote 1 at the end of the table)	Number of media releases via website	MoE	Media Centre for National Development (MoMIM)						N.A
Strategic Objective 3.2 : Create International mechanisms for key stakeholder participation in mangrove management										
No.	Activity	Indicators	Key responsible agency	Other agencies	2022	2023	2024	2025	2026	Budget
3.2.1	Establish National Mangrove Expert group and Task Force* (see 1.1.1 and 1.2.1)	Minutes of regular meetings Key decisions	MoE							N.A
3.2.2	Raise awareness at the coastal community level on the consequences of weak law enforcement, and steps to be taken, individually and collectively, to safeguard against negative externalities on coastal ecosystems	Number of successful awareness sessions	MoE	CC & CRM, DWC, Dis.S, DCC, MEPA, INGO, NGO, FD						1
3.2.3	Support for media campaigns based on the technical aspects of ecosystem decline stemming from weak law enforcement and improper land use and environmental justice	Number of media engagements	All law enforcement agencies, Media	Media, Academia, NGOs Media Centre for National Development						2

Strategic Objective 3.2 : Contd.										
No.	Activity	Indicators	Key responsible agency	Other agencies	2022	2023	2024	2025	2026	Budget
3.2.4	Provide comprehensive training and guidelines for government officers and other parties engaged especially in estuarine and lagoon rehabilitation work and community leaders, * (Please refer footnote 2 at the end of the table)	Number of trainings	MoE	CEA, CC & CRM, DWC, Dis.S, MEPA, INGO, NGO, FD						1
3.2.5	Map and add information regarding mangroves into Divisional and district resource profile	Number of resource profile updated	DS, Dis.S, SLSD	Environment Unit established by MoE in Dis.S						N.A
3.2.6	Include mangrove ecosystems into agenda of coastal DCC	Agenda Item	Dis.S	Environment Unit established by MoE in Dis.S						N.A
3.2.7	Ensure livelihoods enhancement of local communities with innovative financing and involvement mechanisms	Number of people benefited Number of programme implemented	MoF, MoT, NGO/INGO	DoSS Private Sector Investors Dis.S DS Banks						20

Special projects and programmes for strategic objectives 3.1 and 3.2										
No.	Activity	Indicators	Key responsible Agency	Other agencies	2022	2023	2024	2025	2026	Budget
a	Initiate product development and start up businesses using resources from mangrove ecosystems	Number of start-up businesses	Mol, MoT, NEDA	CC& CRM, DWC, Dis.S, MEPA, FD, Chamber of Commerce						1
b	Initiate mangrove focused sustainable and viable business models that would enhance protection and benefit sharing of mangroves	Number of new viable businesses	Mol, MoT, NEDA	CC & CRM, DWC, Dis.S, MEPA, FD, Chamber of Commerce						5
c	Assessment of regulatory, institutional relationships to identify the 'weak links' in law enforcement supported by actual case histories to demonstrate positive and negative consequences (nature clinics)	Number of published case studies Lessons learnt reports	MoE	FD, DWC, BASL, Academia						2

* 1 This website should be supported with up-to-date photos for interaction with the media to maintain a flow of information on relevant problems and issues as well as the steps taken by agencies to conserve to generate sustained national attention. This would enable management of coastal ecosystems to be perceived as a 'national priority' since Sri Lanka is a 'large island nation' in which coastal processes have implications for entire catchments

* 2 This training is on ecosystem relations with a focus on long-term impact on the hydrological volume and tidal prism including unintended consequences of interventions that contribute to sediment build-up, mangrove planting, sand mining and illegal constructions

Table 5: Strategic Objectives, activities, responsible agencies and indicators of goal 04
 (* denotes any action that is already in progress)

Goal 04: A nationwide support for mangrove conservation is formed through awareness among both resource users and general public							
Strategic Objective 4.1: Implement focused awareness to all levels of stakeholders from policy makers to grass root communities							
No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	
					2024	2025	2026
4.1.1	Conduct awareness sessions to policy makers and law enforcement agencies on mangroves, status, regulations and uses and establish mangrove information hub at centralized location (BDS/FD/University)	Number of workshops Policy briefs	BDS of MoE	MEPA, DWC, FD, CC & CRM, NGO			1
4.1.2	Conduct awareness sessions to policy makers and law enforcement agencies on mangroves, status and regulations	Number of workshops Policy briefs	BASL	BDS of MoE, MEPA, DWC, FD, CC & CRM, NGO			0.5
4.1.3	Prepare policy briefs for political authorities on importance, government stance on mangroves and EIA	Printed policy briefs Number of consultations	MoE	CEA,FD, CC & CRM, DWC, MEPA			0.2

Strategic Objective 4.1: Contd.

No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
4.1.4	Encourage youth engagement in restoration through innovative and effective modalities	Number of MOU signed, and actions initiated	FD,DWC	CEA, NGO, Dis. S, DS, SLN, Higher Education establishments, National Youth Council, MEPA, CC & CRM						N.A
4.1.5	Introduce mangrove related information to youth and children via school curriculum	Information provided	MoEd	MoE						N.A
4.1.6	Introduce mangrove related information to youth and children via mangrove day programmes	No. of programmes conducted	MoE	MoEd						1.5
4.1.7	Introduce mangrove related information to youth and children via CEA Environmental Pioneer Programme etc.	No. of environment Pioneer programmes conducted	CEA	MoEd						2
4.1.8	Introduce mangrove related information to youth and children via curriculum development	Information provided to curriculum development	NIE, UGC, Tertiary educational institute	MoEd						NA

Strategic Objective 4.1: Contd.										
No.	Activity	Indicators	responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
4.1.9	Establish an updated online species identification database and information sheets, which would be made available to international research community as well, including to Commonwealth Blue Charter Action Group on Mangrove Ecosystems and Livelihoods (MELAG)	Online data base in MoE Website	BDS of MoE,	Academia, DNBG, NGO+INGO, Research Institutes						N.A
Strategic Objective 4.2 : Conduct causal analysis and identify most significant and important threats and										
No.	Activity	Indicators	responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
4.2.1	Conduct a review on current development plans in area of mangrove and submit a recommendations report to Cabinet of Ministers, governmental agencies etc. on strategic assessment of mangroves	Report presented to Cabinet	NEC of MoE,	FD, CC & CRM, DWC MEPA, CEA						0.5

Strategic Objective 4.2 : Contd.

No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
4.2.2	Conduct causal analysis and prioritize actions to mitigate threats in selected mangrove ecosystems	Report and recommendations	BDS of MoE	CC & CRM, Grama Niladari, DWC, Dis.S, FD, Academia						N.A
4.2.3	Engage in dialogues with stakeholders (national and international) to mitigate threats and for alternatives in selected mangrove areas	Reports and recommendations successfully adopted	FD,DFAR,DWC, NGO,INGO	CC & CRM, DWC, Dis.S, MEPA, NGO, BDS of MoE						3
4.2.4	Propose mangrove ecosystem friendly alternatives to current threats	Alternatives adopted	FD,DWC,DFAR, NGO,INGO	CC & CRM, DWC, Dis.S, MEPA, NGO, BDS of MoE						5
4.2.5	Set targets for tourism, aquaculture, fisheries and saltern practices to make these industries mangrove friendly	Practices successfully adopted	MoT, MoFAR, MoI, NAQDA	MoE						2
4.2.6	Develop and implement pilot waste management initiatives in selected mangrove areas	Operational waste sites	MEPA	MoE, SLN, Local Authorities, MEPA						0.5

Strategic Objective 4.2 : Contd.

No.	Activity	Indicators	Key responsible agency	Other agency/ies	2022	2023	2024	2025	2026	Budget
4.2.7	Identify and maintain at least 10 “waste free” mangrove patches	Operational waste sites	MEPA, SLN,	FD, DWC, CEA, CC & CRM						0.5
4.2.8	Set environment health score card gates in 2 selected mangrove ecosystems with international collaboration as appropriate	Number of gates set	FD, DWC, MEPA, MoFAR, NWPEA	BDS, Universities FM, National and international collaborators						N.A
4.2.9	Establish international collaborations in tackling trans-boundary marine litter affecting mangroves and sharing of technologies and skills	Number of MoUs	MEPA	MoF, MoFAR, MoE, MEPA, Universities						N.A
4.2.10	Promote international collaborations on comparative studies on mangroves	Number of comparative studies	FM	CBD, IORA, CSIRO Universities and research institutes, DWC, CEA						N.A
4.2.11	Seek partnerships for science and solutions for mangrove die back	Number of research interventions	TF	Academia, NSF, NRC						N.A

Key documents to be referred with this National Strategic Action Plan

1. National Policy on Conservation and Sustainable Utilization of Mangrove Ecosystems in Sri Lanka, January 2020, Ministry of Environment and Wildlife Resources, Sri Lanka
2. National Guidelines for the Restoration of Mangrove Ecosystems of Sri Lanka.
3. Guide to Mangroves of Sri Lanka, 2019, Ministry of Environment and Wildlife Resources, Sri Lanka
4. National Biodiversity Strategic Action Plan (2016-2022), Ministry of Mahaweli Development and Environment, Sri Lanka
5. Sri Lanka's Sixth National Report, Biodiversity Profile- Sri Lanka to the Convention on Biological Diversity, 2019, Ministry of Mahaweli Development and Environment, Sri Lanka



Flower of *Lumnitzera littorea* (Jack) Voigt



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