







TIMOR-LESTE

NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (2026-2030)

ACKNOWLEDGMENT

The Government of Timor-Leste expresses its deep appreciation to all institutions, partners, and communities who contributed to the preparation of the updated National Biodiversity Strategy and Action Plan (NBSAP) 2026–2030. This document is the result of a collective effort, reflecting the commitment of government ministries, municipal authorities, civil society organizations, academic institutions, and local communities to safeguard the nation's biodiversity and ensure its sustainable use for present and future generations.

The NBSAP 2026–2030 was updated with technical assistance from United Nations Development Programme (UNDP) and financing from the Global Environment Facility (GEF) through the Umbrella Programme for NBSAP Updates and the Seventh National Report.

We also recognizes the valuable input of Local Communities, whose traditional knowledge and stewardship practices, including tara bandu, continue to play a vital role in biodiversity conservation. Their active participation in consultations across municipalities enriched the NBSAP with locally grounded perspectives and solutions.

Finally, sincere thanks are extended to all individuals and organizations, development partners, UN agencies, NGOs, civil societies, academia, private sectors who participated in national and sub-national workshops in Dili, Baucau, Manufahi, and Liquiça, and to those who engaged in bilateral dialogues. Their dedication and insights have ensured that the NBSAP reflects a whole-of-government and whole-of-society approach, positioning Timor-Leste to achieve its biodiversity vision by 2030.

FOREWORD



It is with great pride and responsibility that I present Timor-Leste's updated **National Biodiversity Strategy and Action Plan (NBSAP) 2026–2030**. As a young island nation blessed with extraordinary terrestrial and marine biodiversity, our forests, coral reefs, mangroves, and freshwater ecosystems are not only natural treasures but also the very foundation of our food security, livelihoods, cultural identity, and climate resilience.

Yet, these invaluable ecosystems face mounting pressures from land-use change, unsustainable harvesting, invasive species, pollution, and the accelerating impacts of climate change. The updated NBSAP is our collective response to these challenges. It provides a comprehensive and actionable roadmap to conserve biodiversity, restore ecosystems, and integrate sustainable management into every sector of national development.

Our vision is clear: By 2030, Timor-Leste's biodiversity and ecosystems are conserved and wisely used by all sectors, providing food security and contributing to poverty eradication and improved quality of life for all Timorese people.

We are proud to present this updated National Biodiversity Strategy and Action Plan (NBSAP) 2026-2030 aligned with the Kunming-Montreal Global Biodiversity Framework (KMGBF), adopted in December 2022. This updated NBSAP addresses all our serious environmental concerns through its well-conceived series of 22 Targets and numerous associated actions. The 22 national targets, adapted from the Global Biodiversity Framework, covering ecosystem restoration, protected areas, species conservation, genetic diversity, sustainable management of productive sectors, invasive species control, pollution reduction, climate adaptation, biosafety, and resource mobilization. These targets are operationalized through a detailed action plan with clear responsibilities, timelines, and links to national policies.

Importantly, the NBSAP strengthens inclusivity and rights-based implementation. It embeds a Gender Action Plan to empower women's leadership, ensures the participation of Local Communities, and recognizes traditional knowledge systems such as *tara bandu*. It also prioritizes capacity-building across ministries, communities, and the general public, ensuring that biodiversity stewardship is shared by all.

A robust Monitoring, Evaluation, and Learning Framework will guide transparent and accountable progress reporting, while innovative financial strategies spanning domestic budgets, fiscal incentives, donor partnerships, private-sector investment, and community-based financing will help close gaps and secure long-term sustainability.

Through this NBSAP, Timor-Leste reaffirms its commitment to the **Convention on Biological Diversity** and to global environmental goals. More importantly, it positions biodiversity as a cornerstone of our sustainable development, climate resilience, and national well-being.

I invite all stakeholders; government institutions, civil society, private sector, academia, and communities to join hands in implementing this Strategy. Together, we can ensure that Timor-Leste's biodiversity continues to thrive, sustaining our people and inspiring future generations.



Francisco Kalbuadi Lay
Deputy Prime Minister
Coordinating Minister for Economic Affairs
Minister of Tourism and Environment
Timor-Leste

EXECUTIVE SUMMARY

Timor-Leste is a young island nation endowed with exceptional terrestrial and marine biodiversity, including globally significant forests, coral reefs, mangroves, and freshwater ecosystems. These ecosystems underpin national food security, livelihoods, cultural identity, and climate resilience. However, biodiversity is increasingly threatened by land-use change, unsustainable harvesting, invasive species, pollution, and the accelerating impacts of climate change. Recognizing these challenges, the Government of Timor-Leste has updated its National Biodiversity Strategy and Action Plan (NBSAP) for 2026–2030 to serve as the country's primary framework for conserving biodiversity and integrating ecosystem management into national development.

The updated NBSAP builds on the lessons of the 2011–2020 NBSAP and is fully aligned with the Kunming–Montreal Global Biodiversity Framework (KMGBF), the Sustainable Development Goals (SDGs), Nationally Determined Contributions (NDC), the Paris Agreement, the National Adaptation Plan (NAP), Land Degradation Neutrality (LDN) commitments, and regional initiatives such as the Coral Triangle Initiative. Developed through an extensive consultation process, including national workshops in Dili and sub-national consultations in Baucau, Manufahi, and Liquiça, as well as bilateral meetings with ministries, NGOs, development partners, and community representatives, the NBSAP reflects a whole-of-government and whole-of-society approach.

The vision of the updated NBSAP is "By 2030, Timor-Leste's biodiversity and ecosystems are conserved and sustainably used by all sectors, providing food security and contributing to poverty eradication and improved quality of life for all Timorese People." To achieve this, the NBSAP positions biodiversity as a foundation for sustainable development, emphasizing integration across agriculture, forestry, fisheries and aquaculture, tourism, and spatial planning.

The Strategy defines 22 interlinked national targets, adapted from the 23 KMGBF Targets, covering ecosystem restoration, protected areas, species conservation, genetic diversity, sustainable management of productive sectors, invasive species control, pollution reduction, climate adaptation, biosafety, and resource mobilization. These are operationalized through a detailed action plan that identifies responsible institutions, timelines, and links to national policies. The NBSAP also provides spatially explicit priorities across municipalities, based on the National Spatial Plan, identifying where agricultural diversification, forestry restoration, sustainable fisheries, community-based tourism, and protected area expansion should occur.

Cross-cutting strategies strengthen the inclusive and rights-based implementation of biodiversity actions. Timor-Leste's National Action Plan on Gender-Based Violence (2017-2021) and the National Strategy for Social Protection (2021) provide complementary frameworks for embedding GEDSI in conservation. GEDSI embedded in the NBSAP is guided by the Maubisse Declaration (2022) and aligned with the four key priorities of the Secretary of State for Equality

(SEI). A Gender Plan of Action outlines measures to support women's leadership, reduce gender barriers, and integrate gender-responsive indicators. A dedicated section on Indigenous Peoples and Local Communities (IPLC) or local community (used in this document) participation ensures rights-based engagement, recognition of traditional knowledge systems such as *tara bandu*, and equitable distribution of benefits. Capacity-building measures target sectoral ministries and departments, as well as communities and the general public.

The NBSAP also includes a country-specific Monitoring, Evaluation, and Learning Framework that identifies headline, component, and complementary indicators. The framework outlines baseline values, target milestones, and responsible monitoring agencies, ensuring transparent and accountable progress reporting toward 2030 commitments.

Financial planning involves a multi-layered approach encompassing domestic budgeting, fiscal and regulatory incentives, donor engagement, private-sector investment, and community-based financing. Resource leveraging will be done through appropriate complementarity with different plans and policies, including those related to climate change and sustainable development. These strategies aim to close current financing gaps and ensure the long-term sustainability of biodiversity initiatives.

The updated NBSAP thus provides Timor-Leste with a comprehensive and actionable roadmap to address biodiversity loss, strengthen climate resilience, and enhance the well-being of its people. It reinforces Timor-Leste's commitment to the Convention on Biological Diversity and positions the country to meet global environmental goals while advancing inclusive and sustainable national development.

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ABO	ASEAN Biodiversity Outlook
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
ATSEA	Arafura and Timor Sea Programme
(S)CBD	(Secretariat of) Convention on Biological Diversity
CF	Community Forest
CI	Conservation International (NGO)
CTI	Coral Triangle Initiative
EIA	Environmental Impact Assessment
ESCAP	(UN) Economic and Social Council of the Asian Pacific
FAO	(UN) Food and Agriculture Organisation
KMGBF	(Kunming-Montreal) Global Biodiversity Framework
GBO	Global Biodiversity Outlook
GFG	Global Forest Goals (UN)
GoTL	Government of Timor-Leste
GM	Genetically Modified
IPLC	Indigenous Peoples and Local Communities
LiDAR	Light Detection and Ranging
LMMA	Locally Managed Marine Area
MALFF	Ministry of Agriculture, Livestock, Forestry and Fishery
MPSI	Ministry of Planning and Strategic Investment
MTE	Ministry of Tourism and Environment
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-Government Organization
NOAA	National Oceanic and Atmospheric Administration (USA)
OECM	Other Effective Area-based Conservation Measures
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PRIF	Pacific Region Infrastructure Facility
SDG	Sustainable Development Goals (UN)

SEA	Strategic Environmental Assessment
SPREP	South Pacific Regional Environment Programme
WCMC	World Conservation and Monitoring Centre

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1. INTRODUCTION

1.1 Background

Global biodiversity loss continues despite the efforts of the Parties to the Convention on Biological Diversity (CBD) and the international agreement to protect biodiversity through the Aichi Targets, under the Strategic Plan for Biodiversity 2011-2020. In response to the continued loss of biodiversity, Parties to the CBD adopted the "Kunming-Montreal Global Biodiversity Framework" (KMGBF). This updated framework for conserving biodiversity has outlined 23 targets and requires countries to revise their National Biodiversity Strategies and Action Plans (NBSAPs) accordingly. The KMGBF has four goals for 2050: restoring and protecting ecosystems and species (Goal A), ensuring the sustainable use of biodiversity for human well-being (Goal B), fairly sharing benefits from genetic resources and traditional knowledge (Goal C), and securing the finance, technology, and policies needed to implement biodiversity action (Goal D)[1] (UN, 2022).

The KMGBF represents a significant shift in the global response to biodiversity loss, moving beyond previous commitments toward a more action-oriented, measurable framework. It sets a clear vision to halt biodiversity loss by 2030 and achieve recovery by 2050, in line with the goal of "living in harmony with nature." The KMGBF emphasizes quantifiable outcomes, such as protecting 30% of the world's land and sea areas, restoring at least 30% of degraded ecosystems, and mobilizing $200 billion annually for biodiversity financing (Lemu, 2025). The framework also highlights the importance of mainstreaming biodiversity into all sectors (agriculture, forestry, fisheries, urban planning, and infrastructure development).

Notably, the KMGBF recognizes the rights and contributions of Indigenous Peoples and local communities (IPLCs) [2], women, and youth in biodiversity stewardship, promoting inclusive governance and equitable benefit-sharing. By linking biodiversity conservation directly to the Sustainable Development Goals (SDGs), climate adaptation, and disaster risk reduction, the KMGBF emphasizes that biodiversity is not just an environmental issue but a foundation for sustainable development, human well-being, and resilience in the face of global change.

In Southeast Asia, losses have been particularly evident due to deforestation driven by agriculture, increased human demand for ecosystem services, unsustainable forest practices, overexploitation, and inadequate enforcement of environmental protection laws (Tan et al., 2022). The Association of Southeast Asian Nations (ASEAN) Biodiversity Outlook (ABO-3, ASEAN 2023) reinforces the findings of the Global Biodiversity Outlook (GBO-5, SCBD 2020), indicating

[1] https://www.cambridge.org/core/journals/international-legal-materials/article/kunmingmontreal-global-biodiversity-framework/2B77

[2] IPLCs are defined under the Convention on Biological Diversity (CBD) and reaffirmed in KMGBF (2022), recognizing their collective rights and traditional roles in biodiversity conservation (CBD/COP/15/L.25; CBD Article 8(j))

that the major global causes of biodiversity decline are deforestation, forest degradation, pollution, climate change, over-exploitation, poor governance, and invasive species.

These findings underscore the region's need to conserve biodiversity to safeguard resilience, food security, and livelihoods. As an ASEAN member, Timor-Leste is expected to align its national biodiversity policies with ASEAN regional frameworks, cooperate on transboundary and marine biodiversity conservation, and participate in regional mechanisms such as the ASEAN Centre for Biodiversity. ASEAN membership reinforces regional coordination, information sharing, and collective action to address biodiversity loss while supporting sustainable development. Moreover, as a Party to the CBD, Timor-Leste can achieve its CBD commitments as well as national policies and priorities through the NBSAP.

1.2 Relevance for Updating Timor-Leste's NBSAP (2011-2020)

Regular updates of a country's NBSAP are essential to ensure its continued alignment with evolving global frameworks and national priorities and commitments. Timor-Leste developed its NBSAP (2011–2020) and updated it in 2015. The plan provided an essential foundation for biodiversity conservation but was prepared under the framework of the Aichi Biodiversity Targets. Under the previous NBSAP, many advances in biodiversity conservation were achieved (documented in the 5th and 6th National Reports to the CBD). At the same time, some activities could not be started, mainly owing to a lack of funding. Hence, the plan needs to be revised to account for what could not be completed and to build on the work and planning accomplished to date.

The previous NBSAP was closely aligned with the UN Sustainable Development Goals, particularly Goal 2 (Zero Hunger), Goal 6 (Clean Water and Sanitation), Goal 12 (Responsible Consumption and Production), Goal 13 (Climate Action), Goal 15 (Life on Land), and Goal 16 (Peace, Justice, and Strong Institutions). However, it did not reflect KMGBF, which was adopted in 2022. Therefore, an update is needed to align the strategy with new global commitments on biodiversity conservation, climate action, and sustainable development.

Additionally, several key national policies were developed after the 2015 NBSAP and are not reflected in its framework, such as the National Climate Change Policy (2021), the National Adaptation Plan (2021) (UNDP 2021; NIES, 2023), the National Tourism Policy (2017), and the Nationally Determined Contribution (NDC) Implementation Plan. A new NDC is in preparation, so both documents need to be aligned. These frameworks focus on climate adaptation, disaster risk reduction, land rehabilitation, and low-carbon development areas where biodiversity plays a vital role but has not been adequately integrated. This lack of coordination limits policy coherence, financing opportunities, and joint implementation efforts.

The earlier NBSAP also does not adequately address new and emerging threats such as marine plastic pollution, invasive alien species, and the growing impacts of climate change on coral reefs and coastal ecosystems. Nor does it include modern biodiversity management elements now required by the KMGBF, such as spatial planning, restoration targets (30% by 2030) (Lemu, 2025), and sustainable financing mechanisms. In addition, new elements, such as biodiversity financing strategies, capacity development plans, spatial planning, and inclusion policies, need to be integrated into the national biodiversity framework, which warrants revising the NBSAP (2011–2020).

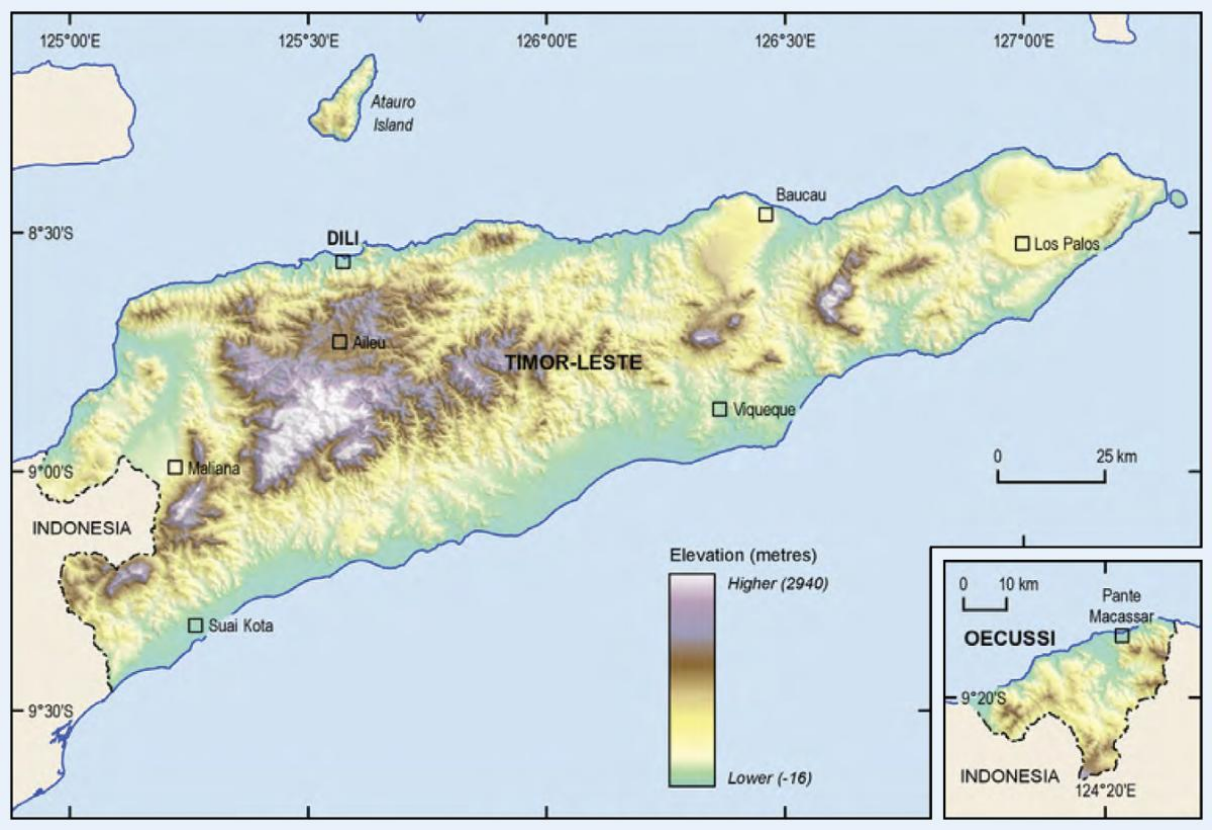
Therefore, updating the NBSAP was not only a compliance exercise with the KMGBF but also a strategic necessity for Timor-Leste. The updated NBSAP will serve as a unifying framework that aligns biodiversity priorities with recent national policies, integrates new global targets, and positions the country to leverage technical and financial support from international partners.

2. BACKGROUND OF TIMOR LESTE

2.1 Geography and Environment

Timor-Leste is located on the island of Timor, bounded to the west by Nusa Tenggara Timur, a province of Indonesia. With two outlying islands, Ataúro and Jaco and the special administrative Region of Oé-Cusse Ambeno (located on the western part of the Island but separated from the rest of the country by Indonesian lands), the total land area of Timor-Leste is approximately 14,870 km^2. This strategic position within the Coral Triangle places Timor-Leste at the heart of one of the world's most biodiverse marine regions.

Rugged mountains, steep slopes, and narrow coastal plains dominate the country's geography. Mountain ranges run across much of the island, with Mount Ramelau (Tatamailau) standing as the highest peak at 2,963 meters above sea level. These steep terrains create a mosaic of microclimates and habitats, ranging from coastal mangroves and seagrass beds to upland tropical forests and montane grasslands. However, the same ruggedness also makes the country highly susceptible to soil erosion, landslides, and flash flooding, particularly where vegetation cover has been lost due to unsustainable land-use practices. The topography of Timor-Leste is shown in **Figure 1** below.


125°00'E
125°30'E
126°00'E
126°30'E
127°00'E
Atauro Island
8°30'S
DILI
Baucau
Los Palos
Aileu
TIMOR-LESTE
Viqueque
9°00'S
Maliana
INDONESIA
Suai Kota
9°30'S
0
25 km
Elevation (metres)
Higher (2940)
Lower (-16)
0
10 km
Pante Macassar
OECUSSI
9°20'S
INDONESIA
124°20'E

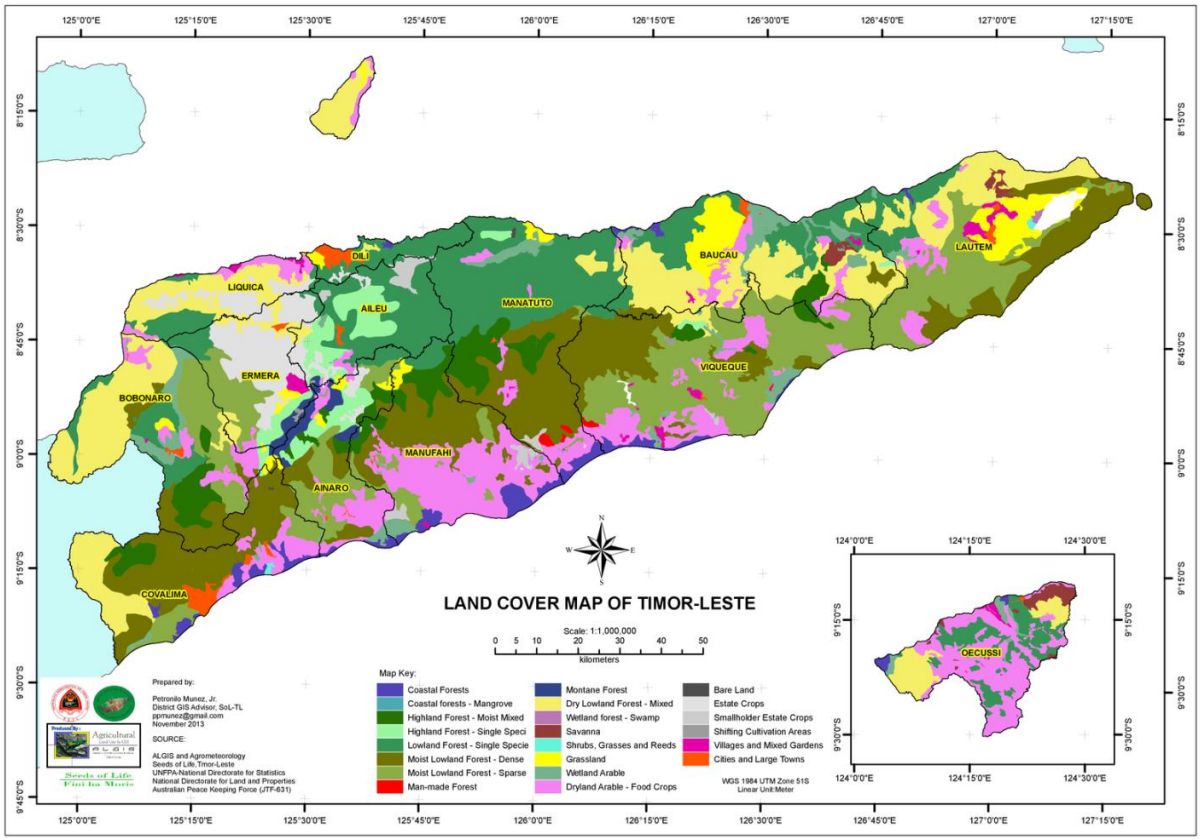

DILI
LIQUICA
AILEU
MANATUTO
BAUCAU
LAUTEM
ERMERA
VIQUEQUE
BOBONARO
MANUFAHI
AINARO
COVALIMA
OECUSSI
LAND COVER MAP OF TIMOR-LESTE
Scale: 1:1,000,000
kilometers
Map Key:
Coastal Forests
Coastal forests - Mangrove
Highland Forest - Moist Mixed
Highland Forest - Single Speci
Lowland Forest - Single Specie
Moist Lowland Forest - Dense
Moist Lowland Forest - Sparse
Man-made Forest
Montane Forest
Dry Lowland Forest - Mixed
Wetland forest - Swamp
Savanna
Shrubs, Grasses and Reeds
Grassland
Wetland Arable
Dryland Arable - Food Crops
Bare Land
Estate Crops
Smallholder Estate Crops
Shifting Cultivation Areas
Villages and Mixed Gardens
Cities and Large Towns
WGS 1984 UTM Zone 51S
Linear Unit:Meter
Prepared by:
Petronilo Munez, Jr.
District GIS Advisor, SoL-TL
ppmunez@gmail.com
November 2013
SOURCE:
ALGIS and Agrometeorology
Seeds of Life,Tmor-Leste
UNFPA-National Directorate for Statistics
National Directorate for Land and Properties
Australian Peace Keeping Force (JTF-631)
Seeds of Life
Fini ba Moris

Figure 1. The topography of Timor-Leste **(Top)** and land use and land cover of Timor-Leste **(Bottom).** Oecussi, displayed on the bottom right, is in the western part of Timor-Leste (Source: Seeds of Life, 2013).

Like other Small Island Developing States (SIDS), people in Timor-Leste rely on agriculture, forestry, hunting, and fisheries activities. They also fetch fuelwood, clean water, and other essential ecosystem services for their livelihoods. Most ecosystem services are directly dependent on biodiversity; therefore, the importance of sustainable development and biodiversity conservation remains critical for maintaining these services (Brockerhoff et al. 2017). The natural environment also provides a wide range of essential services that enable and support resilience to natural disasters and climate change.

Timor-Leste experiences a tropical monsoon climate, characterized by two distinct seasons: the wet and dry seasons. The wet season typically lasts from December to May, characterized by heavy rainfall, high humidity, and frequent thunderstorms, particularly along the southern coast and in mountainous regions. In contrast, the dry season spans from June to November, characterized by clear skies, lower humidity, and reduced rainfall. These climatic variations are primarily influenced by the seasonal shifts of the monsoon winds between the Asian and Australian continental systems (GoTL, 2021; World Bank Climate Knowledge Portal, 2023).

Rainfall distribution across the country is highly uneven. The southern and eastern regions, including Ainaro and Viqueque, receive annual rainfall exceeding 2,500 mm. At the same time, the northern coast, such as around Dili, lies in the rain shadow of the central mountains and receives only 500–1,000 mm per year (UNDP, 2022). This stark difference creates diverse ecosystems from wet tropical forests to dry savannas but also presents significant challenges for water management and agriculture, particularly during the long dry months (GoTL, 2021). Temperatures remain warm year-round, averaging 25°C to 35°C in coastal areas, while highland regions such as Aileu and Maubisse are cooler, averaging 15°C to 25°C (Timor-Leste Ministry of Tourism, Commerce and Environment, 2022). Although seasonal temperature variations are minimal, altitude plays a major role in local climate conditions, influencing agricultural patterns, biodiversity, and settlement distribution. Projected average mean surface air temperature and precipitation for different climate change scenarios are shown in **Figure 2**.

Timor-Leste is highly vulnerable to climate variability and extreme weather events, including flash floods, landslides, and droughts. Intense rainfall during the wet season often causes soil erosion and flooding in deforested and steep areas, while extended dry seasons lead to water scarcity and reduced agricultural productivity (World Bank, 2023). Climate models project that rainfall patterns will become increasingly erratic, with heavier downpours during wet months and longer dry spells, potentially intensifying the frequency of natural disasters (UNDP, 2022). These risks underscore the need for climate adaptation strategies, such as reforestation, watershed management, and ecosystem-based approaches (EbA), to build community resilience and protect biodiversity (GoTL, 2021).

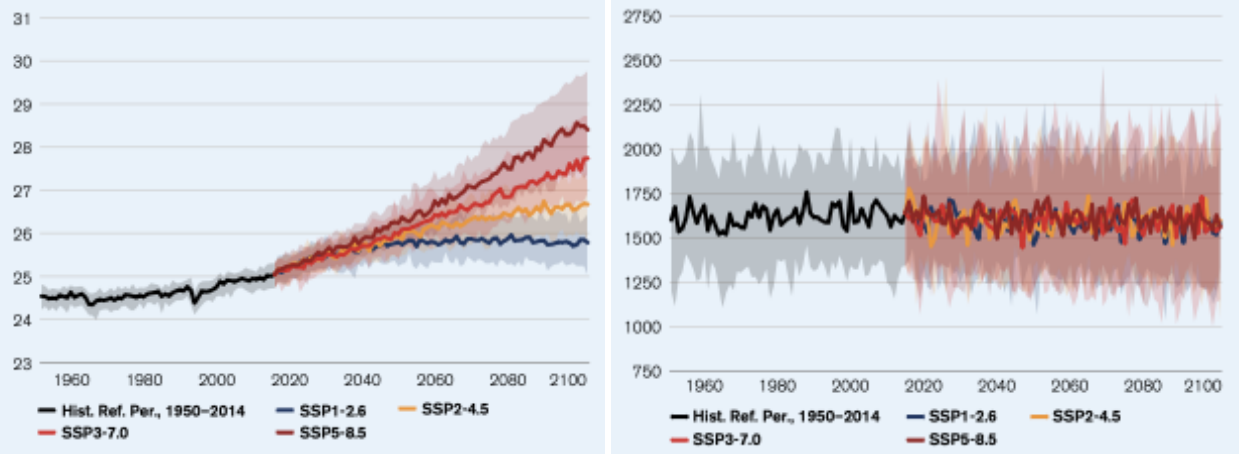


Figure 2. Projected average mean surface air temperature for different climate change scenarios as labeled (left) and projected annual precipitation for different climate change scenarios as labeled (right), along with the 10th–90th percentile dispersion. (Source: Timor-Leste Climate Risk Country Profile, World Bank, 2025)

2.2 Population and Demography

The 2022 Population and Housing Census recorded a resident population of 1,341,737 people in Timor-Leste, comprising 50.58% males and 49.42% females (GoTL, 2023), which increased to 1.42 million by 2025. With a median age of around 20 years, more than half of the population is under 25 (UNFPA, 2021). Over the last decade, the annual population growth rate has fluctuated between 1.7% and 2.5%, suggesting that population growth will likely remain a driver of land-use change in Timor-Leste. The municipalities of Dili, Ermera, and Liquiçá are the nation's most densely populated areas, with an overall population density of 90/km^2 (**Figure 3**). Many people (32.8 % of the population) live in the two main urban centres (Dili and Baucau). The population living in urban areas is 28.6%.

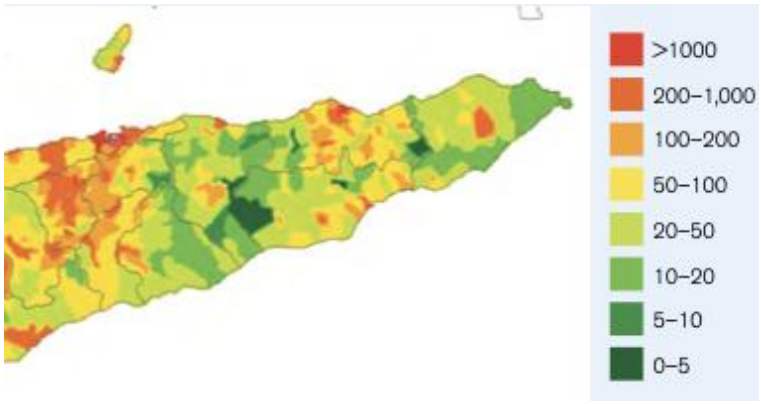


Figure 3. Population density per square km (Source: Climate Risk Country Profile, World bank, 2025)

Although poverty rates have declined in Timor-Leste over time, socioeconomic challenges persist: 42% of the population lives below the national poverty line, 48.3% experience multidimensional poverty, and a further 26.8% are vulnerable to falling into poverty (UNDP / HDRO & OPHI, 2023)[3].

According to the 2022 census, 72.4% of the population aged 10 years and older is literate, up from 67.3% in 2015 (GoTL, 2023). Literacy remains slightly

[3] https://hdr.undp.org/system/files/documents/hdp-document/2023mpireporten.pdf

higher among males (74.7%) than among females (70.0%), reflecting a persistent gender gap. At the time of the census, the total school-going population was 422,880, comprising 211,218 males and 211,662 females. This represents 54.6% of the population in this age group attending school. Notably, a slightly higher proportion of females (55.7%) was enrolled compared to males (53.6%).

According to the Labour Force Survey data[4], in 2021, 62.9% of the Timorese population was of working age, of which only 30.5% were in the labour force (excluding subsistence agriculture). Of those in the labour force, less than 25% were formally employed, i.e., in compliance with the Labour Law, with the remainder being informally employed or self-employed. The 2022 Timor-Leste Population and Housing Census reported that 17,061 people, or 1.4% of the total population, were living with one or more disabilities (GoTL, 2023). The number of males and females with disabilities was nearly equal, with 8,517 males and 8,544 females identified. This represents a slight decrease from the 2016 Demographic and Health Survey (DHS), which recorded a prevalence of 1.8% among individuals aged five years and older who had significant difficulty or inability in at least one of six functional domains (General Directorate of Statistics, Ministry of Health and ICF, 2018).

Language and culture are also determinants of biodiversity conservation, use, and management, as different ethnic groups value biodiversity and nature differently, and beliefs and values are often inherited from one generation to another. Several languages are spoken in Timor-Leste, defined mainly by geographic regions. The most widely spoken is Tetum Terik. In the far east, the Fataluku language is spoken. When one moves towards the west, then Makalero and Makasae languages become more prominent (**Figure 4**).

[4] https://inetl-ip.gov.tl/wp-content/uploads/2023/05/Labour-Survey-TL-2021-summary-report.pdf

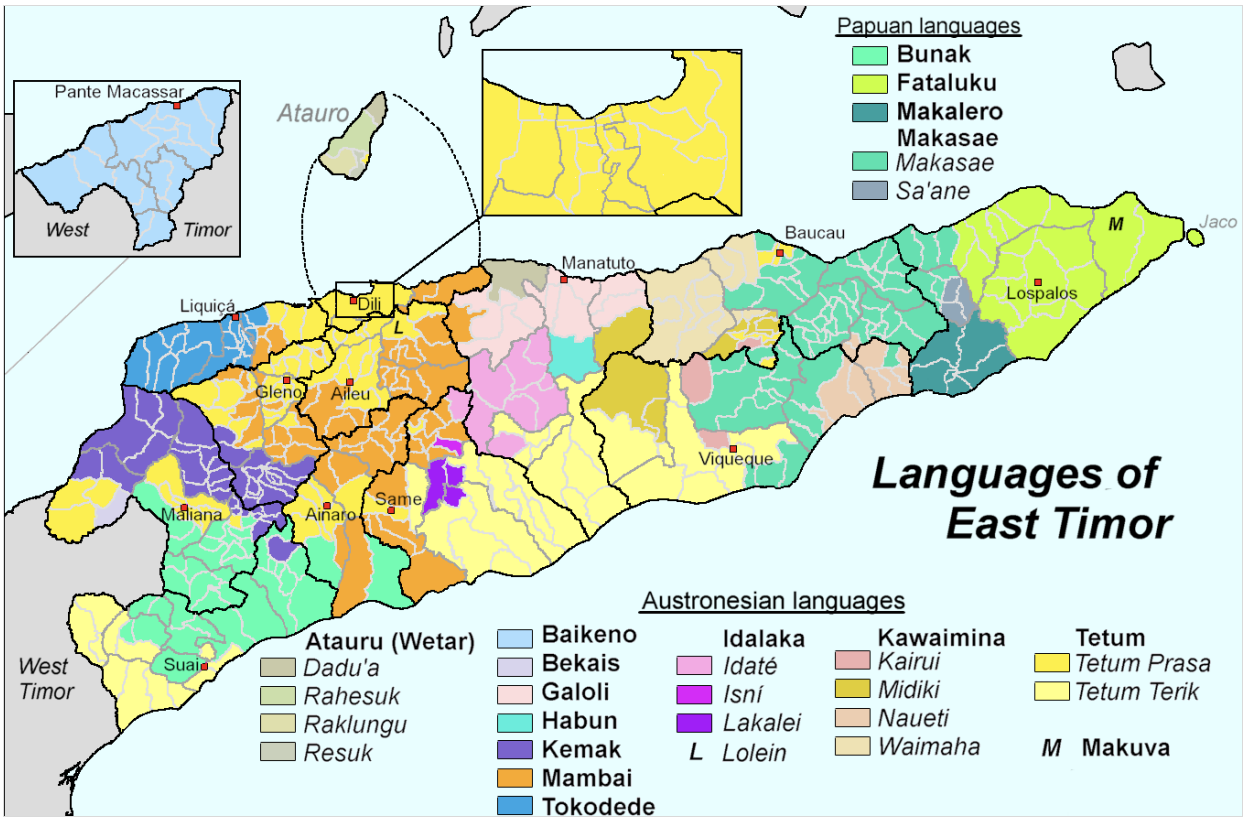


Figure 4. Language variation in Timor-Leste (Source: https://commons.wikimedia.org/wiki/Category:Linguistic_maps_of_East_Timor)

2.3 Major Economy and Livelihood Sources

Timor-Leste's economy remains heavily reliant on petroleum, which contributes over 70% of GDP and about 90% of total state revenues, leaving it highly vulnerable to global oil price fluctuations (World Bank, 2023a; IMF, 2022). Agriculture, forestry, and fisheries employ nearly two-thirds of the population but account for less than one-fifth of GDP (FAO, 2021). Agriculture alone supports about 66% of households and contributes roughly 20–25% of GDP, serving as the foundation of rural livelihoods (World Bank, 2022; FAO, 2023).

Fisheries and other Blue Economy sectors, including aquaculture and seaweed farming, play a growing role in food security and coastal incomes, supported by Timor-Leste's 700 km coastline and 75,000 km² Exclusive Economic Zone (GoTL, 2023). Despite recent progress in poverty reduction, structural challenges, such as limited diversification, high youth unemployment, and a heavy dependence on extractive industries, persist. Expanding climate-resilient agriculture, eco-tourism, renewable energy, and biodiversity-based livelihoods will be essential for building a more sustainable and inclusive economy (UNDP, 2021).

Despite progress in poverty reduction, structural challenges persist, including a narrow economic base, high youth unemployment, and limited private sector growth. The financial dependence on finite petroleum resources underscores the importance of diversifying towards sustainable land management, climate-resilient agriculture, eco-tourism, and renewable energy. Promoting biodiversity-based livelihoods and nature-based solutions could reduce vulnerability, enhance food security, and create more inclusive growth opportunities (UNDP, 2021). Additional details of the roles different economic sectors play in the country's livelihood and economy are discussed below.

2.3.1. Agriculture and Livestock

Most farmers practice subsistence agriculture, growing crops such as maize, rice, cassava, and beans and rearing livestock. These activities are crucial for food security but remain vulnerable to climate change, soil degradation, and low productivity. Coffee is Timor-Leste's main non-oil export, supporting more than 25% of households; yet it remains vulnerable to global commodity price fluctuations and climate impacts (World Bank, 2023b).

The government is promoting climate-smart and diversified farming, with a focus on sustainable land management, agroforestry, and value chains for high-value crops, including coffee, fruits, and spices. Strengthening agriculture is thus crucial to reducing poverty, enhancing food self-sufficiency, and promoting rural resilience in Timor-Leste. Initiatives under the National Strategic Development Plan (NSDP 2011–2030) and the National Adaptation Plan (2021) emphasize sustainable land management, agroforestry, and diversification into high-value crops such as coffee, fruits, and spices. Integrating biodiversity conservation and climate-smart agriculture into the national agenda is increasingly recognized as essential for achieving food security, restoring degraded land, and supporting rural livelihoods. The agriculture sector's transformation, therefore, remains central to Timor-Leste's goals for economic diversification, poverty reduction, and sustainable rural development.

Livestock also plays an integral role in the rural livelihoods and food systems of Timor-Leste. Nearly 90% of rural households own at least one type of livestock, including chickens, pigs, goats, cattle, buffaloes, and sheep, making animal husbandry one of the most widespread livelihood activities in the country (Bettencourt et al., 2014; ACIAR, 2021). Among these, pigs and poultry are the most common species, raised primarily for household consumption, income generation, and social or cultural purposes. According to ACIAR (2021), around 146,000 households in Timor-Leste raise pigs, reflecting the species' social and economic importance.

Economically, animals provide cash income, serve as a form of savings, and can be sold to meet emergency financial needs. They also supply manure for crop production, contributing to soil fertility and integrated farming systems. Socially, livestock hold deep cultural value—used in traditional ceremonies, community feasts, and marriage customs as symbols of wealth and status (López-Angarita et al., 2019). Despite these multiple roles, the livestock sector's overall productivity remains low due to limited access to quality feed, inadequate veterinary care, and insufficient infrastructure (ACIAR, 2021).

From a nutrition and food security perspective, livestock can help address chronic undernutrition in Timor-Leste, where stunting and micronutrient deficiencies remain prevalent. However, while many families rear livestock, the consumption of animal-source foods remains limited, primarily due to cultural preferences, market barriers, and poverty (FAO, 2019; Tilley et al., 2021). Expanding livestock production and improving value chains could therefore contribute to improved dietary diversity and food security in both rural and urban areas.

2.3.2. Fisheries and Aquaculture

Timor-Leste has an extensive coastline of 700 km and is surrounded by many highly productive coral reefs. Important marine habitats along the coast include mangroves, seagrasses, coral reefs, and estuaries. Despite the long coastline, 36% of the population experiences chronic food insecurity due to the poor quality and low quantity of food (National Directorate of Food Security and Cooperation, 2019). Nevertheless, fishing is an everyday activity for most coastal households. Fishing predominantly occurs nearshore, within 5 km of the coast, and is primarily focused on coral reef habitats and the pelagic fore-reef zone (Veillat et al., 2022).

The Committee on World Food Security (CFS) makes important policy recommendations on Sustainable Fisheries and Aquaculture for Food Security and Nutrition, recognising the specific contribution of small-scale fisheries (SSF) to food security and nutrition. Fisheries are an important source of macro- and micro-nutrients. Although fish consumption remains lower than in other Pacific countries, the government aims to increase it by developing sustainable fisheries and aquaculture. Most fishing is small-scale, with an estimated annual catch of about 6,781 tons of marine fish, mainly from traditional boats (Veillat et al., 2022). On Atauro Island, fishing is the main livelihood, while elsewhere it complements agriculture and livestock farming (López-Angarita et al., 2019).

Following the Maritime Boundary Treaty with Australia, Timor-Leste now has greater control over its marine resources, paving the way for the sustainable use of renewable ocean energy and ecotourism. The government's Blue Economy agenda promotes marine conservation, inclusive growth, and cross-sectoral coordination among ministries, aligning with Sustainable Development Goal 14 (Life Below Water) to ensure biodiversity protection and resilient coastal livelihoods.

There is no offshore or deep-sea commercial fishery. The reefs and near-shore areas are highly productive, and the Timor-Leste fishery has a diverse catch composition. The most commonly caught food fish include parrot fish, snappers, surgeonfish, breams, mackerel, scad, barracuda, and sardines. There is also a shore-based gleaning fishery, mostly by women gathering clams and crabs (Tilley et al. 2021). Tilley et al. (2019, 2021) noted that as many as 80% of households in coastal areas are involved in fishing, and women lead at least 50% of these households; however, this highlights a critical gap in fisheries management, as women's engagement remains underrepresented.

When conducted sustainably through effective management, commercial fishing can increase the country's food independence while also improving diet, nutrition and health of Timorese people. The use of fish aggregating devices has been tried successfully and implementation in Timor-Leste has started, although more assistance and training are required (Tilley et al. 2019). There has been concern, however, that such devices may be too successful, resulting in overexploitation, which suggests that careful management is required if their use becomes widespread (Cabral et al. 2014). Investing in improvements to fish storage and preservation is another key area for supporting fish marketing, as fish are prone to post-catch losses to a greater extent than agricultural products. The transport of fish from the coast to the interior mountains poses a significant challenge due to poor road infrastructure and a lack of cold-chain storage, both of which increase food safety risks (Fenzo and Bonis-Profumo 2019).

2.3.3. Forestry

According to Timor-Leste's National Parliament in the General Regime Law of Forests No. 14/2017, "Forest is an area of at least 0.5 ha with trees of actual or potential size greater than 5 m, which grew naturally, forming a natural ecosystem, or that have been planted, and with a higher degree of cover at 15%, which is not under agricultural or other non-agricultural use, forest, or area to which the classification of forest, in terms of the law".

The country reports to the UN Framework Convention on Climate Change (UNFCCC) on the following seven forest types: Moist Highland Forest, Moist Lowland Forest, Dry Lowland Forest, Montane Forest, Coastal Forest, Mangrove Forest, and Forest Plantations. Other forest types are pooled into these latter categories, including savannah, seral forest, and swamp forest (GoTL 2023). Figure 5 presents the national forest map developed in 2013 by the Japan International Cooperation System (JICS) in collaboration with the National Directorate of Forestry (NDF). Since then, no nationwide forest mapping has been undertaken and validated through comprehensive ground-truthing, although several global-scale forest datasets are available. Tall evergreen forest grows in areas with high moisture, while semi-deciduous and tropical dry forests occur on drier sites where conditions are more extreme. Montane forests are found above 1,000 m (but sometimes as low as 500 m), where they appear in mosaics with treeless areas characterized by shrubs and grasses.

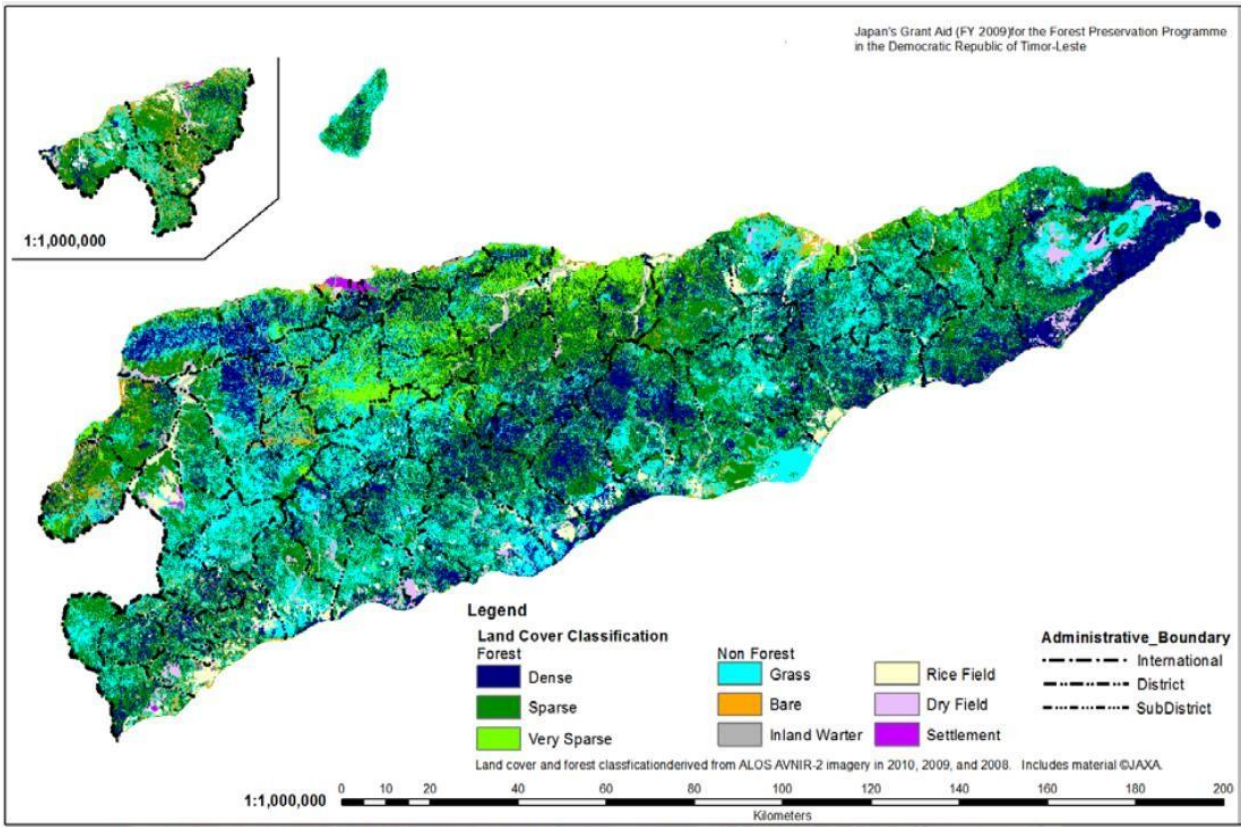


Figure 5. Forest cover map of Timor-Leste based on 2013 Landsat data at 30 m resolution (Source: JICS and NDF. 2013; cited in https://www.cbd.int/doc/world/tl/tl-nr-05-en.pdf).

Distinct vegetation types are found along the coast, including mangroves, beech forests, and coastal strand habitats. Woodlands and savannas occur extensively along the north shore, from sea level to mid-altitudes, including savanna woodlands with an open, low overstory dominated by *Eucalyptus alba*, palms, and/or acacias. In contrast, the open forest found at higher altitudes is dominated by medium to tall native tree species such as *E. urophylla.* There are also plantation forests, primarily of *Eucalyptus, Araucaria, Pinus, Acacia, Terminalia*, *Tectona*, and *Hevea*.

Most forest types can be found in the protected areas system. Still, with <2% of primary forest remaining, there is interest in conserving these remaining forests, some of which are transboundary with Indonesia. Based on geoformation and associated vegetation, Grantham et al. (2011) identified 24 forest types, of which three (*Aliamata, Lariguti*, and *Waibua formations*) were not included in the current or proposed protected area network. Mangroves are a crucial forest type because they provide nursery areas for many marine species, support distinct biodiversity, can be utilized for firewood, store large amounts of carbon, and offer coastal protection from storm surges. There are seven genera in Timor-Leste: *Avicennia sp., Sonneratia sp., Rhizophora sp., Bruguiera sp., Ceriops sp., Lumnitzera sp.,* and *Xylocarpus sp.* The total mangrove area associated with Timor-Leste's reef systems was approximately 18 km^2 in 2008, representing a decline from the 90 km^2 reported in the early 20th century (ADB 2014).

Ilman (2017) found that about 20% of the mangrove stands along the north coast had been degraded from siltation and cutting. Mangroves have been well-mapped through several projects, including those by Boggs et al. (2012) and Ilman (2017). Mangrove restoration was noted as a priority activity in the Nationally Determined Contribution for the UNFCCC (GoTL 2022a) and in the MALFF forest conservation plan.

2.3.4. Tourism

Tourism in Timor-Leste is still in its early stages of development. Still, it is recognized as a priority sector for economic diversification in the National Strategic Development Plan 2011–2030 and the National Tourism Policy (GoTL, 2017). The country boasts rich natural and cultural assets, including the coral reefs of the Coral Triangle, unspoiled beaches, mountainous landscapes, and traditional cultural practices, all of which present opportunities for ecotourism (ADB, 2021). Tourist arrivals remain relatively low, at around 75,000 in 2019, before the COVID-19 pandemic; however, the sector has grown steadily with improved infrastructure and promotion as predicted (UNWTO, 2022). In 2024, the international arrival grew by 23% compared to 2023 (World Bank 2025).

Eco-tourism and cultural tourism are central to Timor-Leste's strategy, emphasizing community involvement and sustainable practices. Initiatives to promote marine protected areas, dive tourism, and community-based cultural tourism highlight the potential of tourism to generate income while also contributing to biodiversity conservation. However, limited infrastructure, insufficiently skilled human resources, and inadequate policy enforcement constrain the sector's growth (GoTL, 2017; World Bank, 2023c). If developed sustainably, tourism could diversify the economy, create jobs, and incentivize local communities to conserve forests, marine ecosystems, and cultural landscapes.

3. BIODIVERSITY CONSERVATION: STATUS, THREATS, AND INITIATIVES

3.1 Terrestrial Biodiversity

Timor-Leste is situated within the Wallacea biodiversity hotspot and supports numerous globally significant ecosystems and endemic species. The hotspot is located north of Australia and bounded by Malesia to the west, Sulawesi to the north, and the South Pacific Islands of Papua New Guinea, Solomon Islands, Tuvalu, and Samoa to the east. The hotspot encompasses the Coral Triangle, a 6 million km^2 area surrounding Indonesia, Malaysia, the Philippines, Papua New Guinea, Timor-Leste, and the Solomon Islands. The Coral Triangle supports 76% of the world's coral species, over 6,000 species of fish, 6 of the world's 7 marine turtle species, and over 2,228 reef fish species[5].

3.1.1. Floral diversity

The Malesian biogeographic region, which includes Timor-Leste, is recognized as a region of very high plant biodiversity with an estimated 41,000 plant species, including 70% of species endemic to the region (Roos et al. 2004, van Welzen et al. 2005). Timor-Leste has 13 known endemic species (IUCN 2023), but plant endemism alone has been estimated at 10.3% (van Steenis 1979, Cowie 2006).

The natural vegetation is tropical dry broadleaf with an undergrowth of shrubs and grasses. Typical trees of the lowland slopes include a tropical chestnut, *Sterculia foetida, Callophyllum teysmanii,* and candlenut (*Aleurites moluccana*). The dominant tree species are *Eucalyptus alba*, *Eucalyptus urophylla*, *Pterocarpus indicus, Casuarina* spp., and *Santalum album*. A survey conducted by BirdLife International in 2006 found 251 native tree species but also found that *Santalum album* is critically endangered. Timor-Leste's main monsoon forest species include *Aegle marmelos, Cassia fistula, Eucalyptus alba, Tamarindus indica,* and *Melia azedarach*. Botanical surveys have recorded more than 1,000 plant species; however, Cowie (2006) estimates, based on a Roos et al. (2004) species-area relationship study, around 2,500 vascular plant species on Timor Island given its diverse habitat.

3.1.2. Faunal diversity

Among the fauna, 169 species are considered resident, 32 are endemic to the Lesser Sundas, and eight are endemic to the Island (**Table 1**). Areas important to birds, amphibians, reptiles,

[5] https://wwf.panda.org/discover/knowledge_hub/where_we_work/coraltriangle/

and orchids have been mapped (Trainor et al. 2007; Grantham et al. 2011) and are being used to support forms of protection, including the identification of suggested new protected areas. Key biodiversity areas (KBAs) have been identified for birds, herptofauna, crocodiles, and orchids (Grantham et al. 2011).

New native species have been reported several times recently, as survey work continues under various projects. For example, O'Shea et al. (2015) reported on a herpetological survey that identified six new species. In 2017, nine new species of carabid beetles were reported from a survey conducted by the Australian National Museum. In 2021, a new species of ground snake, *Stegonotus* sp., was discovered in the lowland forest of the south coast. In 2023, a new gecko (*Cyrtodactylus santana*) was found in Nino Konis Santana National Park, and a new species of worm snake (Laca's wormsnake, *Indotyphlops laca*) was discovered near Dili. These recent discoveries indicate that the full suite of the country's fauna, and likely flora, has yet to be recorded.

Table 1. Known numbers of floral and faunal species in Timor-Leste (from GoTL, NBSAP 2015), updated with the new species noted in the text

Taxa	Number of species	Taxa	Number of species
Vertebrates		Invertebrates	
Amphibians	10	Freshwater molluscs	2
Freshwater fishes	48	Marine molluscs	278
Marine fishes	264	Marine crustaceans	39
Freshwater and marine fishes	22	Coelenterates	2
Terrestrial birds	151	Hexacorals	12
Marine birds	16	Insects	497
Terrestrial and marine birds	91	Plants	
Terrestrial mammals	69	Terrestrial	807
Marine mammals	28	Marine	28
Freshwater reptiles	3	Freshwater	30
Terrestrial reptiles	50		
Marine reptiles	13		
Total	**2460 species**		

An important species, both in terms of human-wildlife conflict and cultural significance, is the saltwater crocodile (*Crocodylus porosus*), which occurs along many coastal areas of the country. The most recent data (Brackhane et al. 2018, Sideleau et al. 2021) showed about 13 attacks on humans per year, with a few fatal, usually when people are subsistence fishing (82.5%), followed by swimming (7.5%) and water collecting (4.2%). Old data showed 130 attacks between 1996 and 2014. The highest proportion of attacks (46.7%) has occurred in southern coastal wetlands, which are also areas of significant importance to local communities for fisheries and timber (Sideleau et al., 2017, 2021).

Culturally, some inhabitants believe that crocodiles are the ancestors of people, raising issues for any active management program. Many believe that a crocodile attack is a punishment from their ancestors for familial transgressions, and it is common for families to not report a crocodile-related death or disappearance due to the stigma associated with an attack (**Figure 6)**. Some believe that the fatal attacks are by crocodiles that have immigrated from Australia.

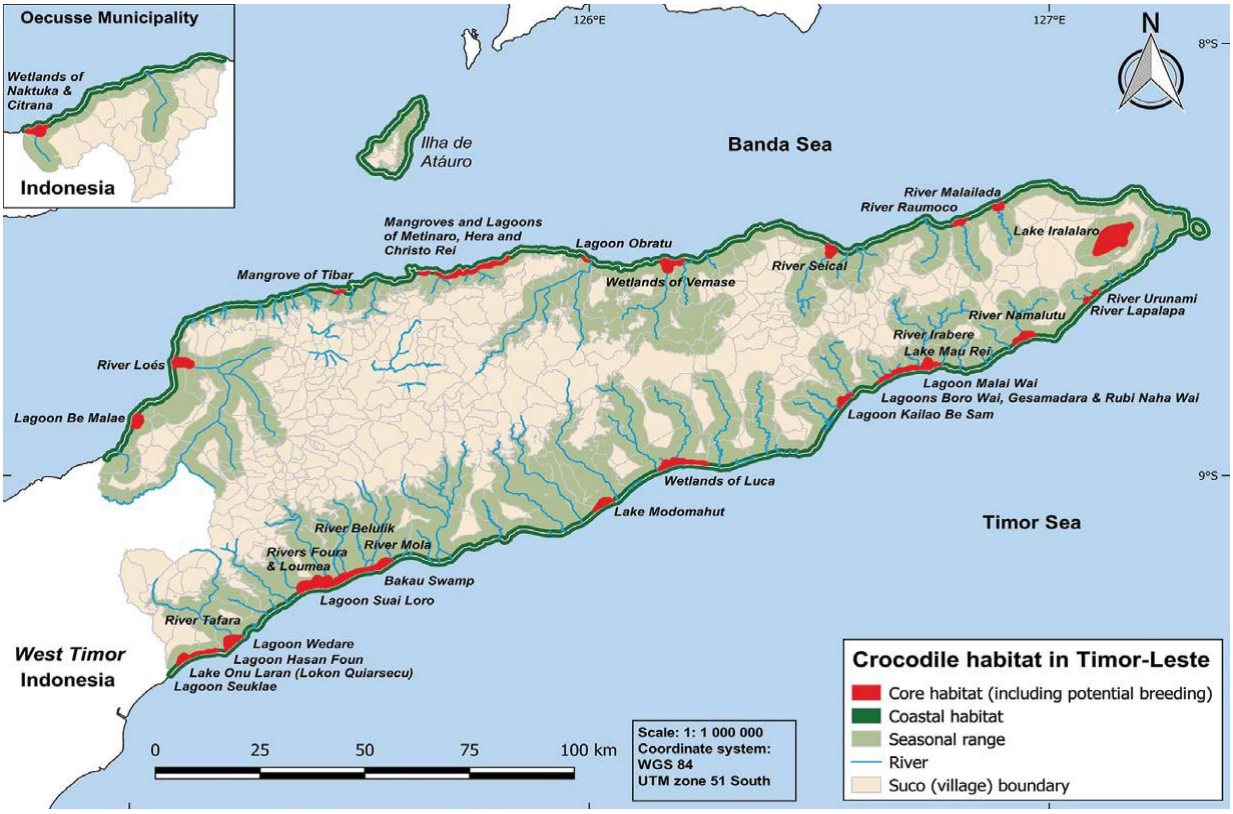


Figure 6. Crocodile habitat in Timor Leste (Source: Brackhane et al. 2018).

3.1.3. Agricultural biodiversity

Agrobiodiversity is central to Timor-Leste's rural livelihoods, nutrition, and cultural heritage. The country's mountainous terrain, microclimates, and traditional farming systems support a diverse range of crop and livestock species adapted to local conditions (MAF, 2019; FAO, 2021). Crop diversity is particularly rich among traditional staple foods. Farmers cultivate multiple varieties of maize, rice, cassava, sweet potato, taro, and beans, often in mixed or intercropped systems that enhance soil fertility and climate resilience. Traditional seed-saving practices and local knowledge have maintained genetic diversity in these crops, particularly in maize and upland rice landraces, which are uniquely adapted to Timor-Leste's dry conditions (da Costa et al., 2020; FAO, 2023). Minor crops, such as sorghum and pigeon pea, as well as local vegetables, also contribute to dietary diversity and resilience against drought.

Horticultural and tree crop diversity is also significant. Coffee, Timor-Leste's primary export crop, includes a unique hybrid known as Híbrido de Timor, a naturally occurring cross between *C. arabica* and

C. canephora discovered in Timor in the 1920s, now globally valued for its disease resistance (World Coffee Research, 2020). Fruit trees, such as banana, papaya, coconut, mango, and breadfruit, along with spice crops like candlenut (*Aleurites moluccanus*) and tamarind (Tamarindus indica), contribute to both subsistence and market-oriented production.

Livestock diversity remains integral to farming systems, providing food, income, and draft power. Indigenous breeds of cattle, pigs, goats, and chickens are widely raised under mixed crop–livestock systems, which support nutrient cycling and enhance livelihood security (MAF & FAO, 2021). Traditional agroforestry and home-garden systems further enhance on-farm diversity by integrating trees, crops, and animals, contributing to soil fertility, erosion control, and resilience to climatic variability (UNDP, 2022).

3.2 Aquatic Biodiversity: Freshwater and Marine

Timor-Leste's marine and freshwater ecosystems form part of the Coral Triangle, one of the most biodiverse marine regions in the world. The country's aquatic biodiversity is exceptionally rich, encompassing coral reefs, seagrass meadows, mangroves, estuaries, coastal lagoons, and deep oceanic waters. Collectively, these ecosystems support a high diversity of species and provide vital ecosystem services, including food security, coastal protection, cultural values, and climate regulation.



Figure 7. Timor-Leste aquatic biodiversity (Source: McKenna et al., 2002)

Surveys have recorded more than 1,000 reef fish species and over 300 species of hard corals (**Figure 7**) in Timor-Leste's waters (McKenna et al., 2002; Erdmann et al., 2013). The Ombai-Wetar Strait and surrounding seas are recognized as an important global migration corridor for cetaceans, including blue whales (*Balaenoptera musculus*), sperm whales (*Physeter macrocephalus*), and multiple dolphin species (Kahn, 2007). Marine turtles such as the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), and olive ridley turtle (*Lepidochelys olivacea*) are also present, with nesting beaches of regional significance. Freshwater ecosystems, though less extensive, are also important. Inland aquatic systems play an essential role in supporting rural livelihoods, subsistence agriculture, and local fisheries.

3.3 Endangered Species

The IUCN (2023) lists 74 species as globally vulnerable, endangered, or critically endangered in the country or its territorial waters, including six endemic species (**Annex 1**). The vast majority of these endangered and critically endangered species are marine, and their listings have primarily resulted from over-exploitation throughout the region. Some species, mostly birds, are migratory, while others, including whales, may migrate over large oceanic areas. In addition to the species listed below, one freshwater fish species, *Oryzias timorensis*, is considered extinct based on IUCN data from 2018.

Timor-Leste hosts several endemic species, with plant species endemism at approximately 10.3% (van Steenis 1979, Cowie 2006). Areas important to birds, amphibians, reptiles, and orchids have been mapped (Trainor et al. 2007; Grantham et al. 2011) and are being used to support protection measures, including the identification of proposed new protected areas. Rivers, lakes, and wetlands in Timor-Leste host native and endemic fish. The species hardyhead (*Craterocephalus laisapi*) was once identified as endemic and endangered (Larson and Pidgeon, 2004), but this is subject to verification and validation because the report itself acknowledges that sampling was inadequate. This suggests that if additional surveys are undertaken across more sites, the species may prove to be more widespread than currently documented.

Timor-Leste maintains a national endangered species list but there is still inadequate data to support the listings and there is no formal process to list species. This can be spearheaded by the National Directorate of Biodiversity. The endangered species includes, among others, the following: Timor green pigeon (*Treron psittacea*), Timor imperial pigeon (*Ducula cineracea*), Wetar ground dove (*Pampusana hoetdii*), Yellow-crested cockatoo (*Cacatua sulphurea*), Timor sparrow (*Padda fuscata*), Java deer (*Rusa timorensis*), and Roti snake-necked turtle (*Chelodina mccordi*).

Sharks, rays, and groupers are among the globally threatened aquatic species in Timor-Leste. Species such as the giant wrasse (*Cheilinus undulatus*), giant guitarfish (*Glaucostegus typus*), scalloped hammerhead (*Sphyrna lewini*), and largetooth sawfish (*Pristis pristis*) are listed as endangered or critically endangered by the IUCN Red List. Mangrove forests and seagrass beds provide nursery habitats for many of these species while also serving as carbon sinks and natural buffers against coastal erosion. Several species are also rare in Timor-Leste. For

instance, Timor snake-necked turtle (*Chelodina Mcordii timorensis*), a subspecies of one of the rarest freshwater turtles in the World, is found around Lake Ira Lalaro (Kulching et al. 2007; Kaiser et al. 2011). This species is also considered Critically Endangered under IUCN Red List criteria and is mainly threatened by human harvest, along with fire and climate change (Eisemberg et al. 2016).

3.4 Biodiversity Threats and Drivers of Change

The ASEAN Biodiversity Outlook (ABO) (ASEAN Centre for Biodiversity, 2023) identified deforestation and forest degradation, invasive species, perverse subsidies, poor governance, and marine plastic pollution as the primary drivers of biodiversity loss in the region. Multiple sources have echoed this assessment, and have also noted that: poor agricultural practices reduce biodiversity (Fanzo and Bonis-Profumo 2019); biodiversity and environment generally is still not ranked highly among the Government's priorities (Lopez et al. 2023); few baseline data hinder management (López-Angarita et al. 2019, Lopez et al. 2023); over-grazing (mostly by goats) hampers forest biodiversity (Fanzo and Bonis-Profumo 2019); montane river valley forest degradation results in sedimentation of estuaries and mangroves (Fanzo and Bonis-Profumo 2019, Wasson et al. 2023; illegal fishing damages reefs (ADB 2014); illegal hunting likely over-exploits some species (Da Silva 2021); marine based pollution mainly from plastics harms marine habitats (Steenhagen et al. 2023); and low departmental funding limits what can be done. These are further discussed below.

3.4.1 Land use change and agricultural expansion

The most recent complete land-use data indicate that just over 60% of the country is forested[6], although most of this forest is sparse (**Table 2**, **Figure 8**). Croplands cover only 4.3% of the land area, despite agriculture being the primary occupation, with 85% of the population relying on it (GoTL 2018). However, there is an estimated 155,000 ha of arable land, or 10.4% of the land area, while permanent meadows and pastures account for 10.1% of available land. Timor-Leste's forest lands are highly degraded, with dense woody and herbaceous weed infestations and stunted annual pasture production (Fanzo and Bonis-Profumo 2019).

Table 2. Land cover types in Timor-Leste (Source: Timor-Leste action plan to combat land degradation, report, 2017b)

Category	Type	Area (ha)	Percent of total land area
Forest Land	Dense Forest	312,930.67	21.2
	Sparse Forest	556,199.74	37.7
	Very Sparse Forest	63,173.45	4.3
Grassland Crop Land	Grassland/shrubs	403,247.22	27.4
	Rice field	41,387.36	2.8
	Dry Farm	22,152.57	1.5
Settlements		2,988.57	0.2%

[6] https://redd.unfccc.int/files/tl_frl__submission-23.01.2022_final_clean.pdf?utm_source=chatgpt.com (Timor-Leste's National REDD+ Forest Reference Level Submission for UNFCCC Technical Assessment in 2023)

Other Lands	Water	22,877.31	1.6
	Bare Land	48,717.01	3.3

There are 10 major watersheds in Timor-Leste: Laclo, Loes, Caraulun, Seical, Tavara, Irabere, Comoro, Tono, Sahe, and Nunura. Only a few of these rivers such as Loes, Laclo, and Clere flow year-round, while most dry up and form pools of stagnant water during the dry season. Twenty-four key wetland sites are environmentally significant and require conservation and resource management. Several of them are connected to the major rivers such as Tono, Clere, Comoro, Vero, and Irabere. These wetlands are of national significance and important for maintaining the quality of life and supporting agriculture, and are essential for migratory bird species, as well as some endangered birds, turtles, and endemic fish. However, the wetland sites face a combination of pressures, including sedimentation, land degradation, tree cutting, sand and stone extraction, sewage and solid waste disposal, poorly located infrastructure, mangrove loss, pollution, and destructive fishing.[7]

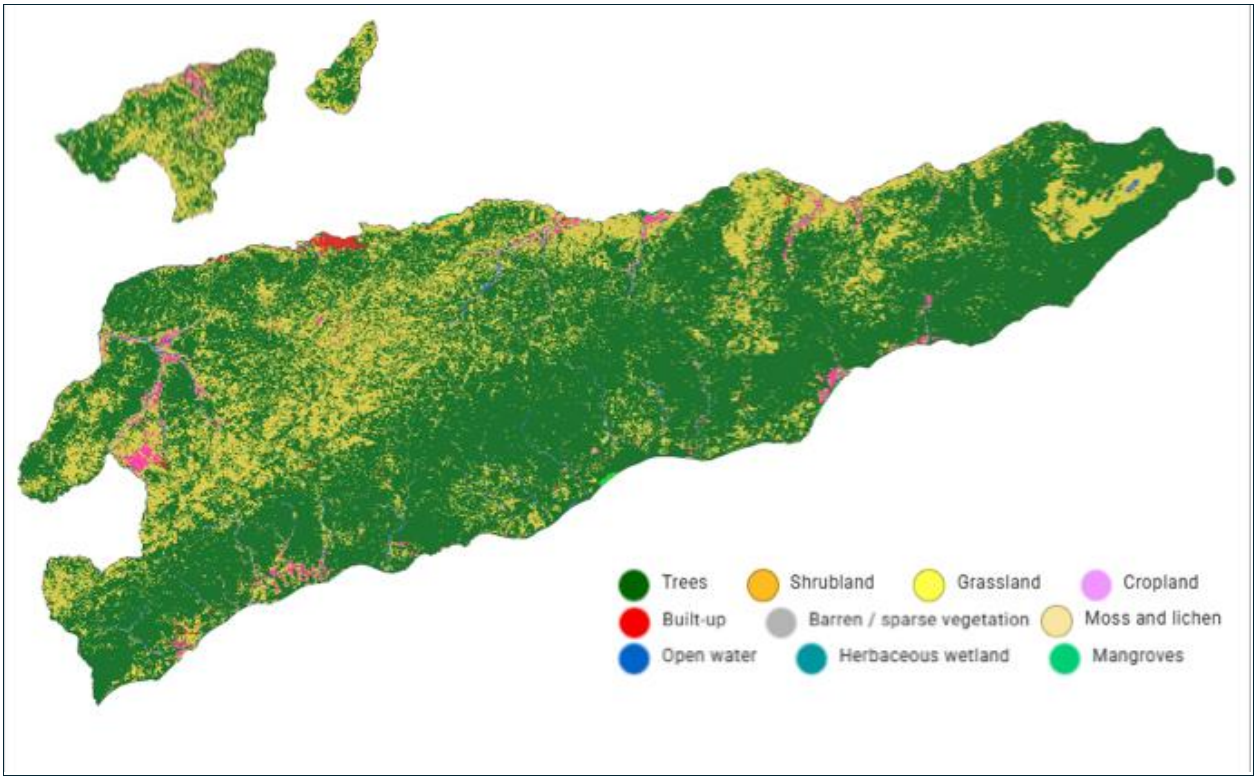


Figure 8. The distribution of land cover types of Timor-Leste (Source: Earthmap; WorldCover 10m 2020/2021 (ESA), https://earthmap.org)

Land degradation is a significant concern nationwide. An estimated 85% of Timor-Leste's population is dependent on agriculture (mostly for subsistence), which has resulted in land degradation through deforestation, illegal logging, and firewood collection; unsustainable agricultural practices such as cultivation on steep slopes, slash-and-burn, and uncontrolled

[7] https://www.fao.org/fileadmin/templates/cplpunccd/Biblioteca/bib_TL_/Timor-Leste_NAP_Revised_Draft.pdf

grazing without incorporating soil conservation measures; and recurring forest fires. Other indirect factors driving land degradation include unsustainable land-use practices such as slash-and-burn cultivation, shifting cultivation without adequate fallow periods, overgrazing, deforestation, and cultivation on steep slopes, exacerbated by poverty, insecure land tenure, demographic pressure, and ineffective law enforcement.

The Table below (**Table 3**) presents the land use and land cover (LULC) change in Timor-Leste between 2001 and 2022, showing both absolute and percentage changes in area for six major land cover categories. The data indicate that forest and wetland areas increased, while grassland, cropland, and water bodies declined. Specifically, forest cover expanded by 15,015 hectares (+7.49%), reflecting gradual natural regeneration or reforestation efforts. Wetlands also grew by 1,296 hectares (+9.05%), likely due to improved water retention and ecosystem restoration.

In contrast, grasslands declined sharply by 4,701 hectares (−55.95%), possibly due to conversion to other land uses, such as cropland or settlements. The cropland area decreased slightly by 15,087 hectares (−1.21%), possibly reflecting land abandonment or urban expansion. Settlements increased substantially by 3,624 hectares (+61.99%), indicating rapid urbanization and infrastructure development. The water bodies category remained relatively stable, showing only a minor decline of 147 hectares (−1.16%). Overall, the figure highlights a pattern of forest recovery and wetland expansion, alongside significant grassland loss and growing urban pressures, suggesting the need for integrated land-use planning and sustainable development strategies in Timor-Leste.

Table 3. Land use Land Cover Change between 2001 & 2022 (Source: https://earthmap.org)

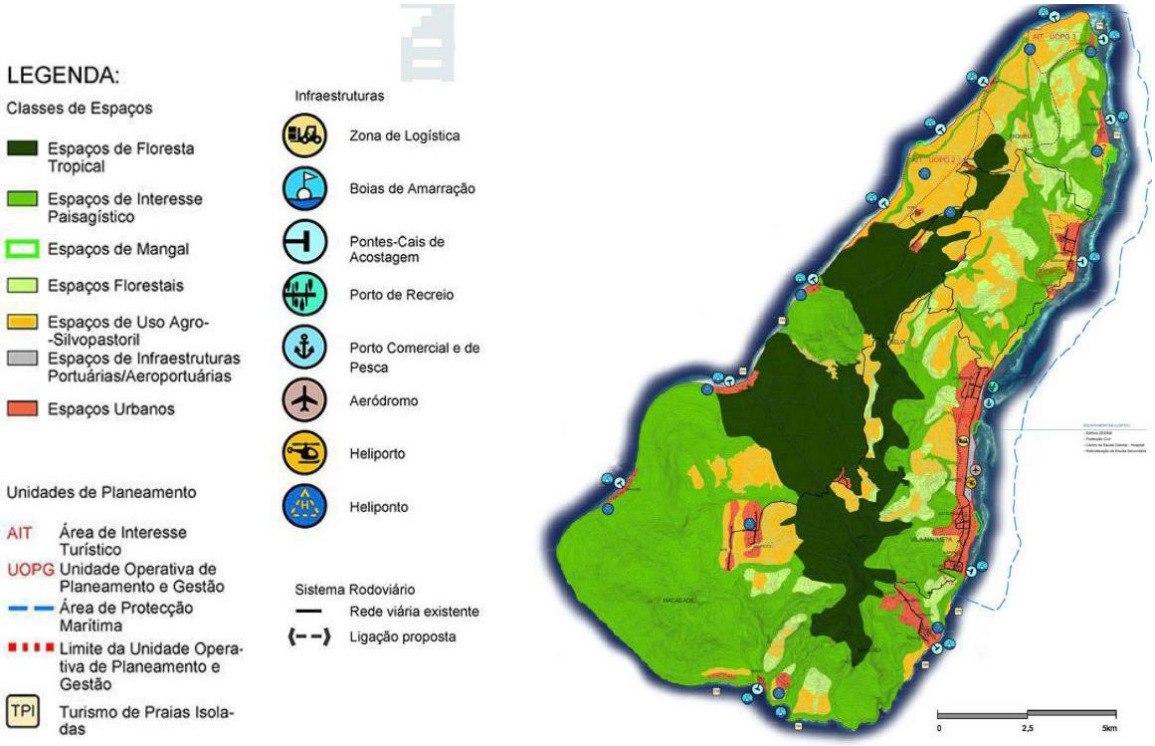
Land use	Total area (ha) in 2001	Total area (ha) in 2022	Change in area (ha) between 2001-2022	Change in area (%) between 2001-2022
Forest	200,420	215,435	+15,015	+7.49%
Grassland	8,402	3,701	-4,701	-55.95%
Cropland	1,247,526	1,232,439	-15,087	-1.21%
Wetland	14,322	15,618	+1,296	+9.05%
Settlement	5,846	9,470	+3,624	+61.99%
Water bodies/No data	12,673	12,526	-147	-1.16%

The government has developed large-scale zoning maps for each municipality in the country[8]. These zones illustrate areas for forests, agriculture, and roads related to future planning of the country. While biodiversity is considered, it is not, however, a driving feature of the mapping. An example map of Atauro Island and Zone 11-Leste illustrates the zonation under

[8] Decree Law 45/2023, MEC

consideration (**Figure 9**). The MALFF is currently working with LiDAR data at a very fine scale to map landscape-agriculture suitability across seven municipalities.

Timor-Leste's total land area, 600,000 hectares are suitable for cropping and livestock production. Around 174,000 ha are estimated as arable land, with an additional 124,000 ha of shrubby cover. However, only 30% of the suitable land is under crops. Farming methods combine subsistence and commercial methods. Rice is commonly planted in warmer lowland areas, maize is grown at medium altitudes, and root crops and coffee are grown at higher altitudes. Unfortunately, most arable lands are degraded, with dense woody and herbaceous weed infestations and stunted annual pasture production (GoTL 2018, Fanzo and Bonis-Profumo 2019). Coffee production, the major cash crop, is operating below its potential and it is estimated that half of the plantations need rehabilitation (ADB 2019). Overall, Timor-Leste is a net importer of food to meet the population's needs (Fanzo and Bonis-Profumo 2019).



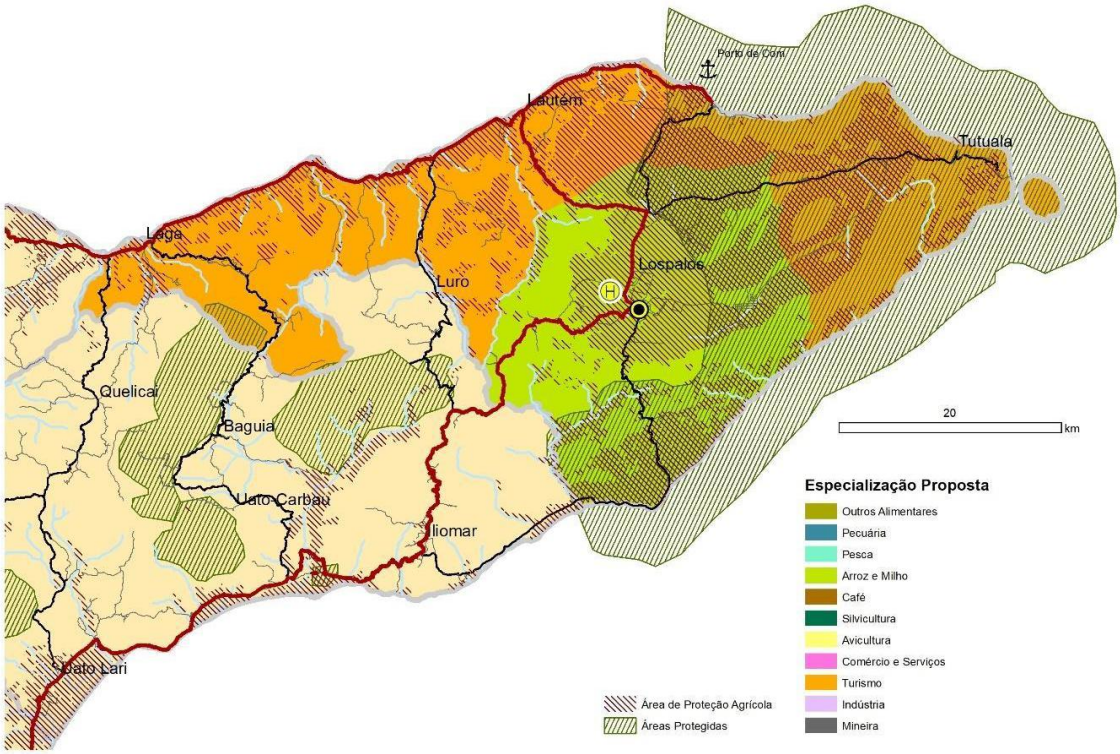


Figure 9. Example land zonation maps of Atauro Island, and Zone 11-Leste, from MEC Decree Law 45/2023 (Atauro Island – above and Zone 11–Leste below)

An estimated 85% of the population is dependent on agriculture, primarily for subsistence. This local dependence has resulted in land degradation through deforestation, illegal logging, firewood collection, unsustainable agricultural practices, including cultivation on steep slopes, slash-and-burn or shifting cultivation, and uncontrolled grazing without incorporating soil conservation measures, as well as recurring forest fires. Other indirect factors driving land degradation include unsustainable land-use practices, poverty, insecure tenure of tenure, fisheries and coastal ecosystems, demographic pressure, and ineffective law enforcement (GoTL 2018).

Highland plains at elevations between 300 and 700 meter above sea level (MASL) are dominated by agricultural lands, particularly irrigated for rice production. Groundwater levels are low and the low water retention attributes of the soil types contribute to flooding during the rainy season. The plains are of high economic importance, contribute to approximately 21% of ground and tree crops, and are the most important agricultural area (NBSAP 2015). The highland plains differ significantly in soil types and water availability. Large parts of the Maliana plains are cultivated for irrigated rice production and in normal years, constitute an essential part of the “breadbasket” of Timor-Leste.

The plains along Lospalos are mainly used for grazing. The soil types make the area swampy during the rainy season, while the clay soils dry out and crack in the dry season. The plains

around Baucau airport are generally drier and less cultivated. The groundwater is low, so that, while people in the escarpment (Baucau city and towards the sea) have abundant water all year round, people on the plains rely on deep wells to access water during the dry season. Some moist lowland areas, originally covered mainly by deciduous forest, semi-evergreen forests, or rainforests, have been converted to cultivated lands, plantations, and secondary vegetation (NBSAP 2015).

The agriculture sector is challenged by a lack of high-yielding crop varieties, water shortages, weeds, and low soil fertility. Storage of seed and grain, and the handling of coffee, require investment to improve. A lack of adequate land for cultivation puts pressure on forests, forcing people to cut down trees to obtain more arable land and firewood. Pest infestation and diseases, low production, 'slash and burn' farming, invasive alien species, post-harvest rot/decay, and the threat of extinction of local rice varieties are the main issues in the localities of Maliana, Liquiça, Baucau, Ainaro/Maubisse, Manatuto, Bobonaro, and Viqueque, where their main crops are rice, maize, cassava, coconut, potato, and cabbage (NBSAP 2015).

Work on crop development began in 2014. The MALFF, through its National Directorate for Research, Statistics, and GIS has collected locally 92 species of cultivated crops to conserve and promote their cultivation in the future. The collections were done from six municipalities, including Baucau, Lautém, Liquiça, Manufahi, Maliana, and Viqueque and the species are now at the Collection Centre of Loes and Betano for further development. Researchers at the UNTL have also promoted the use of local varieties, particularly local grain legumes, through testing for adaptation to low coastal areas for cultivation after rice harvest (Gusmao, 2016; 2017; 2018; & Gusmao et al., 2020). Furthermore, the Department of Agronomy and Centre for Climate Change and Biodiversity of the UNTL, in cooperation with the Agricultural Innovation for Communities, conducted a 5-year project (2017 to 2022) funded by the Australian government to research new technologies, such as use of rice husks and rice husks plus nutrients, in promoting production of various local and introduced crops and horticultures in the lowland paddy fields areas after the rice crop is harvested.

3.4.2 Unsustainable fish harvest

In Timor-Leste, fisheries are a significant source of livelihood, but with the substantial increase in global fishing, which has led to species declines (FAO, 2022), the lack of data on harvesting introduces significant uncertainty into the country's fishery sustainability. Despite the richness, aquatic biodiversity is under pressure from overfishing, destructive fishing practices (e.g. Unsustainable fishing practices include blast fishing, the use of cyanide or other toxic substances, illegal fishing methods, and activities that damage coral reefs and coastal ecosystems through harmful net use, trampling, and anchoring), coastal development, mangrove clearance, and climate change impacts such as coral bleaching and ocean acidification (Alongi 2015; WorldFish 2018; Freeman et al. 2022)[9]. Weak enforcement of marine and fisheries laws further exacerbates these threats (World Bank, 2018). Although Locally Managed Marine Areas (LMMAs) play an essential role in reducing over-harvesting, their efforts

[9] https://www.cbd.int/doc/nr/nr-06/tl-nr-06-en.pdf

are insufficient. Limited coverage, weak enforcement, inadequate resources, and ongoing illegal and unsustainable fishing pressures reduce their overall effectiveness. Therefore, LMMAs need to be supported by stronger government enforcement, broader fisheries regulations, and coordinated marine conservation strategies. Although the constitution recognizes formal, unified, state-backed tenure system, no such facilities exist. However, some communities have successfully protected land and fisheries resources and avoided "tragedy of the commons" outcomes through their own customary institutions and local governance arrangements, which need to be replicated and strengthened.

Threats to the fisheries include stock sustainability relative to the rate of exploitation, ecological impacts of fishing operations, transboundary conflicts, conflict between sectors, lack of infrastructure and market access, inadequate boats and fishing gear, poor access to credit, and illegal or unreported fishing (ADB 2014, López-Angarita et al. 2019). Furthermore, traditional fishing is also a culprit in the decline of fish populations due to the increasing number of fishers, the adoption of destructive fishing methods, and the use of harmful equipment in recent years. ADB (2014) also documented destructive fishing practices in Timor-Leste, which include dynamite fishing or blast-fishing that physically destroy coral reefs; cyanide fishing, which poisons reef organisms to capture live fish; and the use of air compressors for harvesting high-value species such as trochus and sea cucumbers. However, despite the reduction in vessels, foreign fleets continue to fish illegally in Timor-Leste's waters, exploiting gaps in the country's enforcement of its oceanic boundaries, resulting in an estimated annual loss of between US$53 million and US$106 million to the Timorese economy (ADB 2014).

Illegal fishing by fishers who use destructive fishing techniques, such as dynamiting coral reefs, permanently destroys fish habitats. As a result, the abundance of valuable commercial and upper-trophic-level species, such as snapper and grouper, is notably low in near- and offshore reef systems, confirming that these fish populations are likely being harvested at rates exceeding sustainable levels (ADB 2014). Alleviating these problems requires strengthened monitoring and reporting to support country-level efforts to address the unregulated and unreported elements. While enforcement has increased, the issue of illegal fishing remains common and so ongoing careful management is required to support reef biodiversity, especially for commercial fish species, and to avoid habitat destruction (ATSEA 2023 a,b).

3.4.3 Invasive species

Invasive species have become a common global driver of biodiversity loss (IPBES 2023). In Timor-Leste, Grantham et al. (2011) suggested that one-third of the country's 52 mammal species have been introduced to the Island and are likely to have accelerated the decline of some of the endemic fauna through predation, competition, introduction of new diseases, and/or consequential habitat change. According to Trainor (2010), the most problematic among the invasive vertebrate species are: Common Spotted Cuscus (*Phalanger orientalis*), Long-tailed Macaque (*Macaca fascicularis*), Common Palm Civet (*Paradoxurus hermaphroditus*), Eurasian Wild Pig (*Sus scrofa*), Rusa Deer (*Cervus timorensis*), House Mouse (*Mus musculus*), House Rat (*Rattus tanezumi*), Brown Rat (*R. norvegicus*), Polynesian Rat (*Rattus exulans*), and House Shrew (*Suncus murinus*).

Plant health surveys conducted by Timorese and Australian biosecurity agencies have compiled an inventory of >500 naturalised and pest plant species, based largely on recent field collections supplemented by observational and literature records (Westaway et al. 2018). Among these species, 26% have their origin in horticulture, introduced as ornamental garden or amenity plants. Recently introduced apple snails (*Pomacea spp.*) have damaged rice crops, but no survey data are available to confirm the extent of the problem (Brito et al. 2019). Over the past few years, both Tilapia and Banabe have been introduced by MALFF and used in aquaculture, but no risk has yet been identified. However, since tilapia generally threatens native fish species, strict management and monitoring of the species is warranted to address its potential future threats.

The Westaway et al. (2018) biosecurity surveys across the country found numerous problematic invasive plants (**Table 4**). These plant species include Siam weed (*Chromolaena odorata*), which, among these invasives, probably has had the greatest impact on Timorese agriculture and livelihoods. This species forms a dense, tangled bush and is considered one of the world's most invasive plants, quickly invading and smothering native vegetation. Another similar issue is caused by the fast-growing shrubby weed, Lantana camara, which was introduced to Timor with cattle from Bali in 1912. This toxic plant rapidly spread over the island and now covers much of the grazing and crop lands.

Other plants with significant negative effects include *Calotropis gigantea, Jatropha gossypiifolia, Senna tora,* and *Chromolaena odorata*. Miss flower has been reported as a weed that also affects biodiversity, grass production, and coffee plants, mainly at elevations of 1000 m or higher above sea level (Williams 2018). Despite evidence of alien species in Timor-Leste, there has been no quantitative assessment of the extent of damage to biodiversity or agriculture.

Unwanted and invasive biodiversity can also be introduced into marine ecosystems when ships empty their ballast water as they take on cargo. A study by Ximenes Nunes (2021) suggested that Timor-Leste needs to develop a National Ballast Water Management Strategy, establish a National Task Force, invest in technical skills for seafarers and the staff of the National Directorate of Maritime Transport, adopt a domestic law to regulate ballast water discharge, and ratify the International Convention for the Control and Management of Ships' Ballast Water and Sediments.

Table 4. High-impact invasive plant species on Timorese agriculture and environment.

Number	Species
1	*Ageratum riparia* (Regel) R.M.King & H.Rob.
2	*Calotropis gigantea* (L.) W.T.Aiton (Apocynaceae)
3	*Chromolaena odorata* (L.) R.M.King & H.Rob. (Asteraceae)
4	*Jatropha gossypiifolia* L. (Euphorbiaceae)
5	*Lantana camara* L. (Verbenaceae)

6	*Leucaena leucocephala* (Lam.) de Wit (Fabaceae)
7	*Mesosphaerum suaveolens* (L.) Poit. (Lamiaceae)
8	*Mimosa diplotricha* C.Wright (Fabaceae)
9	*Prosopis pallida* (Humb. & Bonpl. ex Willd.) Kunth (Fabaceae)
10	*Senna tora* (L.) Roxb. (Fabaceae)
11	*Sida acuta* Burm.f. (Malvaceae)
12	*Vachellia nilotica* (L.) P.J.H.Hurter & Mabb. (Fabaceae)
13	*Ziziphus mauritiana* Lam. (Rhamnaceae)

Source: Westaway et al, 2018 and Biodiversity Sixth National Report, 2019

3.4.4 Pollution

Timor-Leste is currently experiencing disastrous impacts on marine ecosystems, health, and biodiversity due to the ever-increasing land- and marine-based plastic pollution (Steenhagen et al. 2023). Approximately 13% of the waste stream is comprised of plastic. The Pacific Region Infrastructure Facility (PRIF) estimated that approximately 20.7 Mt of plastic waste was released into the waters around Timor-Leste in 2010, with the amount expected to rise to 64.2 Mt by 2025 (PRIF 2018). The trends seem to continue. A 2024 solid waste management survey for Dili (conducted by JICA) indicates substantial ongoing issues with plastic waste generation and management, though it does not yet provide a national leakage estimate into the marine environment[10].

In 2017, a test program collected marine litter from two sites: a little-used site at Kusu, where 20 people collected 300 kg of mostly plastic and rubber, and a heavily used area at Dolok Oan, where more than 2700 kg were collected by 130 people (Lopes 2017). Consequently, the government has committed to eliminating plastics from the natural environment by 2023 through the ambitious 'Zero Plastic Timor-Leste' campaign. So far, however, little has changed.

Two international private companies, Caltech and Veolia, signed an MoU in 2020 to introduce international best practices in waste management in Timor-Leste. The company established the country's first waste transfer station in 2021, marking an important step toward structured waste handling and recycling. In addition, it co-founded the Plastic Alliance, a platform aimed at promoting plastic waste reduction and improved plastic management across the country.[11] However, current operations remain limited in scale and geographic coverage, indicating significant potential and a need to expand and scale up successful models to achieve nationwide impact. There is no waste management center at the ministry level to scale up promising practices such as composting, recycling, and the reuse of domestic, commercial, and other waste products.

[10] https://en.tatoli.tl/2024/11/20/timor-leste-needs-to-take-significant-action-to-tackle-the-waste/17/?utm_source=chatgpt.com
[11] https://www.caltechgrp.com/our-history/

Protection of Timor-Leste's environment from plastic pollution is necessary by adoptive various practices such as banning or phasing out single-use plastics, imposing stricter import controls on non-essential and non-recyclable plastic products, promoting reusable and sustainable alternatives, introducing producer responsibility for plastic recovery and disposal, and strengthening enforcement of existing laws and policies. This will only be possible through extensive amendments to legislation and policies that prioritize prevention. This can be done through strict import rules, supported by an effective implementation of the international treaty on plastic pollution that mandates core obligations, control measures, and implementation measures to eliminate plastic pollution at all stages of the plastics life cycle. Decree Law 37/2020 for the Disposal, Import, and Production of Bags, Packaging, and Other Plastics, and Government Resolution No. 15/2016, a National Strategy for Sea Waste Management, all recognize the pollution issues; however, enforcement and compliance are lacking.

Educational awareness-raising is already carried out by the Environmental Center of Education and Information (Centro de Educação e Informação Ambiental) and the Directorate General of Environment of the Ministry of Tourism and Environment. However, its impact is not at scale. Government documents such as the Sixth National Report and the NBSAP describe environmental education challenges in Timor-Leste as arising from limited institutional capacity and resources, weak curriculum integration, low public awareness, logistical barriers to outreach, insufficient cross-sector coordination, and the lack of a systematic monitoring system. Therefore, what is needed is to begin forging regional private-public partnerships, growing economies of scale for container return schemes and other reduction, refill, reuse, and recycling programmes. Furthermore, policies and plans are necessary to support educational and awareness-raising campaigns.

For solid waste, there are substantial policies in place for collection and recycling but most household waste is still burned or discarded, recycling is below capacity, and the Tibar dumpsite is still an open dump, causing harm to the environment and human health (ADB 2014). The annual waste audits conducted by SPREP and MRA Consulting Group (2023) reported that the solid waste stream is composed of plastics 6.6% (contrasts the PRIF estimate of 13%), paper 19%, organics 58%, and metals 3%. Plastic waste is not managed in an environmentally sound manner, posing a significant risk to oceans and estuarine waterways, although limited data are available.

3.4.5 Climate Change Impact on Biodiversity

Small island developing states are considered highly vulnerable to climate change due to their geographic location, size, exposure to natural hazards such as storm surges, and limited adaptive capacity. The low level of socio-economic development makes Timor-Leste even more vulnerable to climate change. The country's dependence on subsistence agriculture means that climate shocks have immediate consequences for food security and rural livelihoods. Sea level rise and the periodic droughts and heavy rains, including cyclones, are causing erosion on deforested slopes, leading to downstream sedimentation and flooding (World Bank, 2021).

These processes contribute to sedimentation in rivers and coastal areas, further degrading fisheries and mangrove ecosystems that communities rely on for subsistence and coastal protection (ADB, 2021). As a result, the KMGBF has a target to address climate change, with a focus on enhancing ecosystem-based adaptation.

Sea-level rise represents a major long-term threat. Low-lying coastal settlements and critical infrastructure, including roads and ports, face increasing inundation risks, with projections indicating that Timor-Leste could experience a rise of 0.6–1.1 meters by 2100 under high-emission scenarios (IPCC, 2021). Coastal erosion and saline intrusion already undermine agricultural lands and freshwater supplies. Combined with population growth and limited urban planning, these pressures heighten the country's vulnerability to displacement and loss of livelihood assets (GoTL, 2021).

Increasing average temperatures owing to climate change will continue to impact Timor-Leste over the coming decades. Timor-Leste's climate is highly variable and is expected to become even more so in the future, as climate change interacts with and exacerbates pre-existing variability, increasing the potential for extreme weather events. The coordinating Minister for Economic Affairs produced a map of the local vulnerability to climate change (**Figure 10**). The impact of warming on rainfall patterns and sea surface temperature is expected to be significant for Timor-Leste. The incidence of extreme rainfall events is expected to increase during the wet season. At the same time, rainfall received during the dry season is expected to decrease overall. These trends will increase flood risks and threaten food and water security. Increasing sea-surface temperatures are expected to accelerate coral bleaching and ocean acidification, which, in addition to increasing the risk of storm damage to fisheries, will compound the pressure on Timor-Leste's reefs. These direct impacts have severe implications for Timor-Leste's economy and its biodiversity (GoTL 2022a).

Records from 1950-2009 show definitive effects of climate change on the country: regional sea surface temperatures have increased by 0.15 to 0.2 °C per decade, likely reflected in a similar increase in air temperatures, and sea levels have risen by 9 mm/year between 1993 and 2009. The rise in sea level around the island is much higher than the global average increase of 2.8 to 3.6 mm/year (GoTL 2022a). As sea level continues to rise over the coming decades, the resulting impacts on freshwater resources, soils, and coastal zones will persist, regardless of short-term fluctuations in global emissions trends. The increased risk of floods, droughts, extreme weather events, coastal flooding, and saltwater intrusion, as well as impacts on coral reefs and fisheries, has the potential to drastically affect food security by increasing the likelihood of crop loss, reducing agricultural productivity, and driving biodiversity loss and fisheries decline.

Recognizing these risks, Timor-Leste has integrated climate change into its national policy framework. The country has ratified the Paris Agreement, participates actively in UNFCCC negotiations, and has submitted its Nationally Determined Contributions (NDCs). Its updated NDC (2021) prioritizes ecosystem-based adaptation (EbA), renewable energy expansion, and resilience-building in agriculture, water, and coastal protection. These priorities are aligned

with KMGBF, which emphasizes the role of ecosystems in enhancing climate adaptation and resilience.

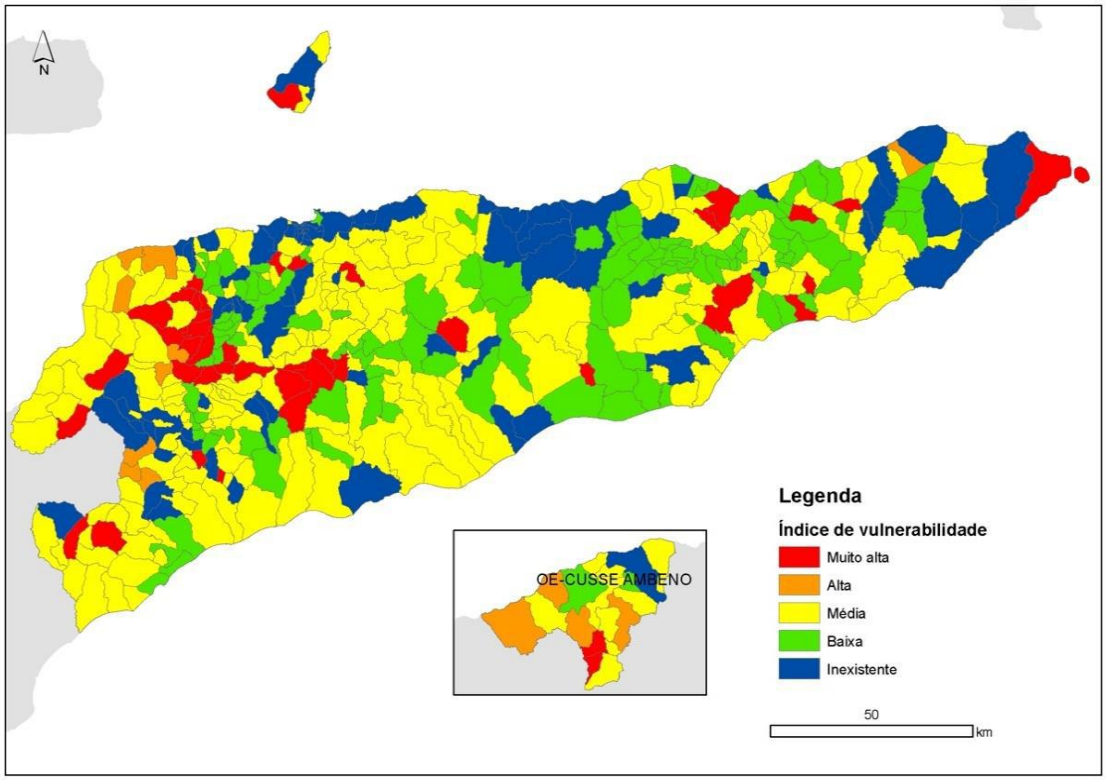


Figure 10. Map of expected local vulnerability to impact of climate change (From MCE/MCAE, 2023)[12].

Globally, climate change is driving biodiversity loss (Habibullah et al. 2022). However, for terrestrial vertebrates, climate change appears less critical than habitat loss and overexploitation, which are the main drivers of loss (Caro et al. 2022). Climate change is a primary driver of community compositional change, rather than changes in species populations (Jaureguiberry et al. 2022). However, climate change interacts with other variables, including exploitation and habitat change (e.g., Ramirez et al. 2017), leading to greater loss.

Climate change is likely the most challenging and pervasive problem facing the world, in large part because it is a tragedy of the commons. The UNFCCC has enabled several agreements, including the Kyoto Protocol and Paris Agreement, but many countries have failed to meet their targets. The KMGBF also addresses climate change under Target 8, as it has become a major driver of biodiversity loss, either directly or indirectly (Pörtner et al. 2021). This target requires countries to reduce the effects of climate change on biodiversity by increasing its resilience through mitigation, adaptation, and disaster risk reduction actions, including the use of nature-based solutions and/or ecosystem-based approaches. This is especially true for reforestation, where the focus should be on heterogeneous forests with native species, with the goal of re-

[12] Decree Law 45/2023. MCE.

establishing landscape connectivity and enhancing areas within and near protected areas. These approaches can also deliver numerous social, economic, and environmental co-benefits.

As a small island, Timor-Leste is particularly vulnerable to climate change, including sea-level rise, coral bleaching, and desertification. Climate change poses an immediate threat to national biodiversity, especially in the marine environment, including reefs, as well as to food and water security and, hence, the health and welfare of the Timorese people. Without concerted actions to address climate risks, climate change will exacerbate existing inequalities and erode development gains. The Government of Timor-Leste is committed to proactively managing and reducing the impacts of climate change on national economic, physical, environmental, and social security (GoTL,2022a).

The country has been active at the UNFCCC and has recently submitted its NDC. It is aiming to develop a Climate Change Law since 2023 to protect and enhance carbon sinks, as well as to create new sinks through nature-based solutions and suggests that any such actions should consider biodiversity and ecosystem services. For example, carbon farming has become an essential tool for reforestation in Timor-Leste, with companies launching large-scale tree-planting projects, in some cases involving NGOs such as Fundação Carbon Offset Timor, WithOneSeed, Rai Matak Foundation and OXFAM. For the law to be followed, these carbon farms need to be part of a larger and strategic spatial plan, be ecosystem-based, and consider biodiversity as an objective through the re-establishment of native natural vegetation.

3.5 Need for Conserving Biodiversity

Biodiversity in Timor-Leste underpins the country's ecological integrity, cultural identity, and socio-economic well-being. The nation's terrestrial, coastal, and marine ecosystems provide essential ecosystem services, including food, freshwater, energy, building materials, and income through fisheries, agriculture, and eco-tourism. Forests regulate water flows, protect soils from erosion, and sustain agricultural productivity, while mangroves, coral reefs, and seagrass beds act as natural defenses against storm surges and coastal erosion. Beyond these ecological functions, biodiversity is deeply embedded in Timor-Leste's traditions, customary practices, and community livelihoods.

However, decades of conflict, widespread poverty, and unsustainable practices have intensified pressures on natural systems. Deforestation for agriculture and fuelwood, overfishing, illegal wildlife harvesting, and weak enforcement of environmental laws have eroded biodiversity across the country. Mining, infrastructure expansion, and climate change further compound these threats, even if the scale is minimal. As a result, Timor-Leste faces a decline in biodiversity that undermines food security, reduces resilience to climate shocks, and heightens vulnerability to disasters such as droughts, floods, and coastal erosion.

The need for biodiversity conservation is not only ecological but also economic. With over 70% of the population depending on agriculture and natural resources for subsistence, degraded

ecosystems directly threaten household livelihoods and national development goals. Marine biodiversity, particularly in the globally significant Coral Triangle region, supports artisanal fisheries and presents opportunities for sustainable eco-tourism, a key pillar of the National Tourism Policy (GoTL, 2017). Conserving these resources is therefore a prerequisite for diversifying the economy, reducing dependency on imports, and creating jobs for a growing population. Effective management of biodiversity will also enable Timor-Leste to meet its international obligations under KMGBF, SDGs, and multilateral agreements such as the Convention on International Trade in Endangered Species (CITES), the UNFCCC, UN Convention to Combat Desertification (UNCCD), and the Ramsar Convention. Strengthening biodiversity governance, monitoring, and reporting will not only improve conservation outcomes but also attract greater international support and financing.

Equally important is the sustainable use of biodiversity. Traditional agroforestry systems, sustainable fisheries, and community-based forest management can provide income, food security, and cultural benefits while maintaining ecosystem integrity. Harnessing biodiversity through eco-enterprises, organic farming, and nature-based tourism offers pathways for inclusive economic growth. By linking conservation and sustainable use with livelihood benefits, Timor-Leste can create a virtuous cycle where protecting biodiversity reinforces human development and vice versa. In sum, conserving, managing, and utilizing biodiversity in Timor-Leste is both a necessity and an opportunity. It is vital for sustaining the nation's ecological foundation, improving resilience to climate change, supporting community livelihoods, and advancing sustainable development. Without decisive action, the loss of biodiversity will erode not only natural capital but also the long-term social and economic security of the people of Timor-Leste.

3.6 Important Conservation Initiatives

3.6.1 Conservation and Sustainable Use of Agrobiodiversity

A key national initiative is the “Sustainable Management of Agro-Biodiversity in Timor-Leste” project, implemented by the Ministry of Agriculture, Livestock, Forestry and Fisheries (MALFF) in partnership with GIZ, the National Directorate of Biodiversity, the national NGO PERMATIL, and the National University of Timor-Leste. This programme focuses on *in situ* conservation of traditional crop varieties and livestock breeds while promoting biodiversity-friendly farming practices. The project strengthens local seed systems, documents local genetic resources, and supports farmers through participatory resource mapping, gender-responsive farmer field schools, and awareness campaigns. Importantly, it integrates women’s and men’s traditional knowledge in seed selection and conservation, recognizing their complementary roles in sustaining agricultural diversity (GIZ, 2020; G-FRAS, 2021).

Agrobiodiversity is also integrated into national policy frameworks. The Timor-Leste Strategic Development Plan 2011–2030 identifies agricultural diversification and the preservation of indigenous crop species as key pillars for rural development, food security, and climate

resilience (GoTL, 2011). Similarly, the NBSAP recognizes agrobiodiversity as an essential component of genetic diversity, calling for its conservation through both *in situ* and *ex situ* measures, improved seed systems, and sustainable farming practices (GoTL, 2015; FAOLEX, 2021). The National Agricultural Policy (2017) also emphasizes sustainable land management and the use of native plant varieties to adapt to changing climatic conditions.

Complementary to these efforts, several donor-supported programmes have promoted agroforestry systems and biodiversity-friendly value chains. The EU-supported Partnership for Sustainable Agroforestry (2017–2022), implemented with MALFF and World Agroforestry (ICRAF), promoted the integration of tree crops such as coffee (*Coffea arabica*), sandalwood (*Santalum album*), cashew (*Anacardium occidentale*), and teak (*Tectona grandis*) into smallholder farms, enhancing both biodiversity and economic returns (UNDP, 2019; Paudel et al., 2022). Agroforestry interventions in upland areas are also aligned with forest and watershed rehabilitation priorities under the National Forest Policy (GoTL, 2017c).

Community-based initiatives play equally important role. NGOs such as PERMATIL and Haburas Foundation have been promoting traditional agricultural systems that preserve soil fertility, native crops, and seed-sharing networks. These efforts help maintain genetic diversity within subsistence crops like maize (*Zea mays*), rice (*Oryza sativa*), beans (*Phaseolus vulgaris*), and root crops, which are vital to local food security. At the same time, they promote permaculture approaches and home gardens as models of resilient, biodiversity-rich farming systems (PERMATIL, 2018). At the institutional level, MALFF, with support from FAO and other partners, is working to develop a National Genetic Resources Centre and strengthen ex situ seed conservation facilities, including the national seed laboratory and genebanks (FAO, 2020; GoTL, 2024). These initiatives aim to safeguard traditional crop varieties against loss and support breeding and reintroduction programmes. Moreover, research institutions and universities are increasingly documenting traditional agricultural knowledge and mapping agro-ecological zones, providing scientific baselines for biodiversity-friendly agricultural planning (Fanzo & Bonis-Profumo, 2019).

Overall, these initiatives demonstrate a growing commitment to linking agricultural development with biodiversity conservation in Timor-Leste. By combining policy frameworks, community engagement, and technical assistance, the country is gradually developing a foundation for sustainable agricultural landscapes that protect native genetic resources while improving livelihoods. For the NBSAP 2026–2030, it is crucial to strengthen these ongoing efforts by setting clear national targets for genetic diversity conservation, farmer participation, and gender inclusion, and by integrating agroforestry and climate-resilient agricultural practices into national biodiversity and food security strategies.

3.6.2 Sustainable Fisheries and Marine Ecosystem Management

A flagship programme called Arafura and Timor Seas Ecosystem Action Program (ATSEA) was launched in 2010. The programme improved the management of fisheries throughout the Arafura and Timor Seas Large Marine Ecosystem region. Its main objectives were to (1) reduce marine plastic pollution, (2) plan for mitigating and preventing oil spills, (3) Improve fishery

management and reduce the small-scale illegal, unreported, and unregulated fisheries, and (4) stop the declines of populations of endangered, threatened, and protected species, including dugongs, six species of sea turtles, (such as green turtle, hawksbill, loggerhead, leatherback, olive ridley and flatback turtle), and several sharks and ray species (Annex 1).

The ATSEA programme has set several ambitious targets, including a 20-30% increase in marine protected areas, reducing illegal fishing in at least three identified hotspots, and increasing women's representation to at least 50% of beneficiaries of project livelihood activities and outcomes. Coastal habitat mapping was completed in 2012, yielding classifications of six marine and seven coastal habitat types (Grantham et al., 2011; Boggs et al., 2012). A regional Marine Protected area (MPA) network and action plan has been developed under this programme for enhanced protection of marine turtle.

Further mapping of a baseline for much of the nearshore habitats was completed by the Pacific Islands Fisheries Science Center (PIFSC, 2017) to support management and climate change. Nearshore waters along the entire coastline of Timor-Leste are fully covered by WorldView-2 satellite imagery (**Figure 11**). These maps were developed to support spatial ecosystem planning in the area. A shoreline management plan has been developed to monitor and reduce shore impacts (McCue 2020). Other major advances are being made under the WorldFish 'Fishery Sector Support Program' (WorldFish 2019). WoldFish, developed in collaboration with the then Ministry of Agriculture and Fisheries (now MALFF), an online open-source monitoring system called PeskAAS, which is a pseudo-acronym for fisheries (Tilley et al. 2020)[13].

The legal framework for fisheries was revised to reflect local cultural, ecological, economic, and nutritional security contexts through a participatory stakeholder consultation process and evidence from recent sectoral research. The previous legal instrument governing fisheries was replaced by a contextual, implementable framework comprising 140 articles. The GoTL has taken over the English version of the law and translated it into Portuguese, but yet to be endorsed by the Parliament.

The WorldFish program has also deployed digital monitoring equipment (referred to as Peskas Automated Analytics System or PeskAAS) on a sample of small boats to monitor catch in real time at 17 villages, providing an advanced method of monitoring nearshore fisheries (Tilley et al. 2020, Tilley pers. comm.). This programme has provided data on catch by species, the number of fishers, areas fished, and catch values since 2018[14], thereby dramatically improving the country's fishery management data. These sampled harvest data are then extrapolated to other villages to estimate the total fishery harvest for Timor-Leste. The dataset also includes the mapping of boat trips from each sampled area.

[13] https://worldfishcenter.org/project/peskaas-automated-analytics-system-small-scale-fisheries-timor-leste
[14] file:///C:/Users/17052/Downloads/data_report.html



Figure 11. Fisheries and aquaculture activities in Timor-Leste

Locally managed marine areas (LMMAs) appear to have had success in improving fishing practices and reducing illegal harvesting, partly through the *Tara Bandu initiative.* However, there is little data to support a conclusion. LMMAS were established at Adara on the west coast of Ataúro Island in 2015, with other nearby regions added since (Kim 2021), mainly with the assistance of Conservation International. Blue Venture has also been working with communities to establish and improve management of LMMAs in four areas, as well as providing training on dive-based reef monitoring and volunteer catch monitoring at landings. Alternative livelihoods are also encouraged through a small-grants loan programme[15].

FAO's Regional Fisheries Livelihoods Program for South and Southeast Asia (RFLP) – a regional program, implemented in six Asia-Pacific countries (2009-2013), including Timor-Leste aimed to strengthen small-scale fisheries livelihoods and sustainability by building national fisheries governance systems and supporting co-management, thus aiming to strengthen *tara bandu* for

[15] https://blog.blueventures.org/en/women-pilot-savings-and-loan-scheme-in-timor-leste-to-introduce-alternative-livelihoods-in-communities/

fisheries management in Baucau (Needham et al., 2013). Likewise, WorldFish implemented an initiative on the Participatory development of the first exclusively marine *tara bandu* in the community of Adara on Atauro Island, in support of the Australian Center for International Agricultural Research, between 2015 and 2016. Through that initiative, Adara adopted a highly participatory, community-led approach in which local stakeholders, together with government agencies, defined fisheries rules, boundaries, penalties, and a closed reef area supported by a locally agreed "reef tax" for divers and snorkelers.

Another method used to expand the availability of fish as a food source is freshwater aquaculture (GoTL 2012a, b). The MALFF can scale up learning from the WorldFish and USAID programs to strengthen the sector (Pant et al., 2019; US-AID, 2021). To become an important business sector, aquaculture needs to be scaled up by increasing fish productivity and reducing production costs through ongoing research and development. Both agencies have been providing training and attempting to scale up the industry to a commercial level. As of 2019, there was no legal framework to regulate aquaculture in Timor-Leste (López-Angarita et al. 2019). Issues requiring legislation include both receiving and expended water quality (Beveridge and Phillips 1993) and the fish species permitted, as well as ensuring food safety during transport and marketing.

3.6.3 Sustainable Tourism and Biodiversity Conservation

Tourism is recognized as a priority sector for sustainable economic growth and biodiversity conservation in Timor-Leste. The Strategic Development Plan 2011–2030 and the National Tourism Policy 2017–2021 promote nature-based and community tourism as tools for rural development, poverty reduction, and environmental protection (GoTL, 2011; 2017a).

Timor-Leste's tourism is primarily nature focused. The Nino Konis Santana National Park serves as the flagship ecotourism site, integrating biodiversity protection with community benefits through locally guided trekking and bird-watching activities (Da Silva, 2021). In the marine realm, Atauro Island and several Locally Managed Marine Areas (LMMAs) have become hubs for diving and snorkeling. Partnerships with NGOs such as Blue Ventures and WorldFish promote reef conservation and "no-take zones," linking tourism income with the recovery of marine biodiversity (Blue Ventures, 2022).

Community-based tourism initiatives in upland areas such as Maubisse and Mount Ramelau showcase cultural heritage and forest ecosystems while reinforcing traditional Tara Bandu regulations for sustainable resource use (Haburas Foundation, 2020). Decree-Law 5/2016 on Protected Areas encourages low-impact tourism that is compatible with conservation goals, and revenue from park fees and diving permits supports management and environmental education (GoTL, 2016). Key potential tourism areas and activities are presented in **Figure 12**.

Projects such as the UNDP-GEF Conservation Areas for Biodiversity and Ecosystem Services (CABES) and the ADB Sustainable Tourism Project (2021–2025) are strengthening protected-area management and integrating environmental safeguards into tourism planning (UNDP, 2019; ADB, 2022). While institutional capacity and waste management remain challenges (Da

Silva & Bui, 2021), well-managed ecotourism provides tangible incentives for conservation, community empowerment, and financing of protected areas.

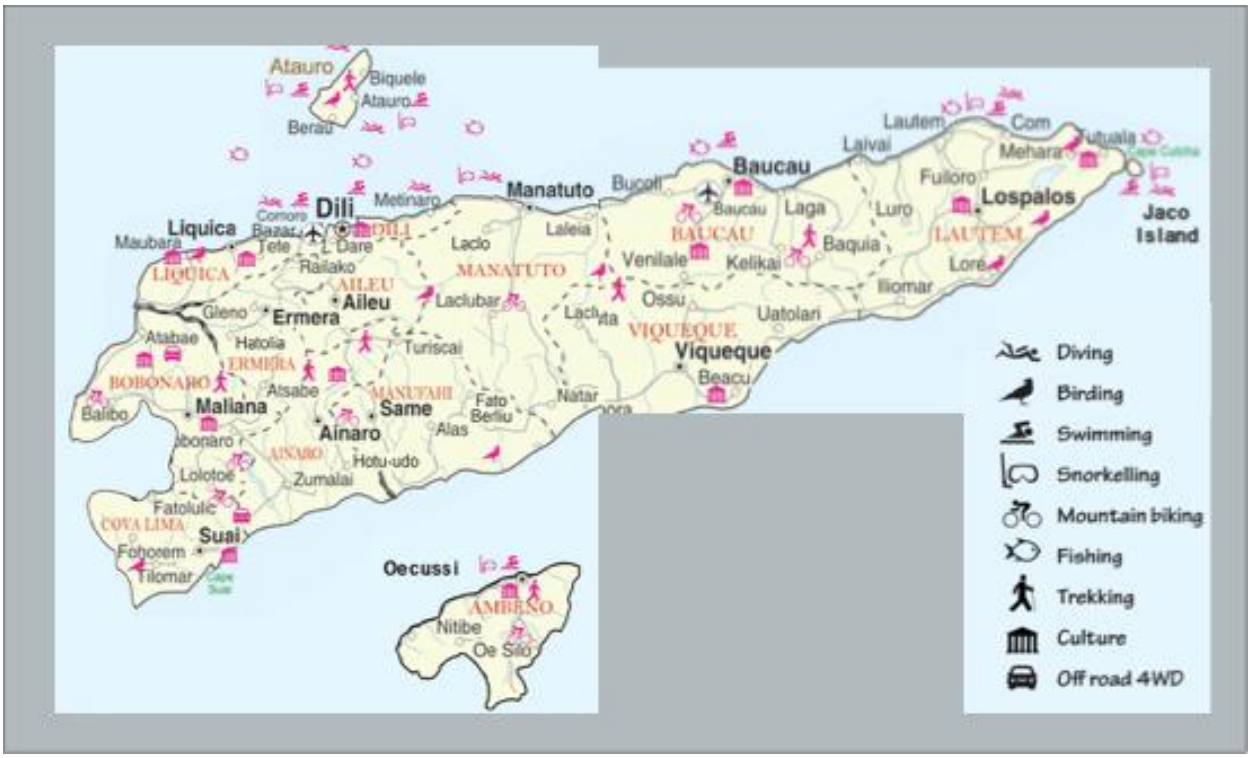


Figure 12. Map showing potential eco-tourism activities in Timor-Leste (Source: Timor-Leste National Tourism Policy, 2017)

3.6.4 Forest Protection, Improved Management and Policy Reform

The UNFCCC, based on the Paris Accords and COP/28, requires countries to report deforestation and degradation in their successive NDCs. The most recent national-scale survey of forest and land cover, conducted in 2013, was undertaken under the National Conservation Plan by MALFF in cooperation with the National Directorate of Forestry and the Japan International Cooperation System (GoTL et al., 2013). Two maps were produced, for 2003 and 2010, using Landsat imagery (30 m spatial resolution), and for 2010 also ALOS AVNIR-2 (10 m spatial resolution) to assess change and illustrate the current forested areas.

Timor-Leste's last Forest Resources Assessment report indicated a forest area of 921,000 ha in 2020 (FAO 2020). Deforestation is a serious problem that causes biodiversity loss across Southeast Asia, and Timor-Leste is no exception. According to Timor-Leste's Initial National Communication to the UNFCCC (2014), the annual loss of forest cover between 2004 and 2010 was around 2.23% per year. Whereas the 'Nationally Determined Contribution to the UNFCCC and the National Forest Policy (GoTL 2017c) stated that approximately 869,000 ha (about 60% of country's total area) of the total land area of the country is covered by forest (which is the exact figure in the GoTL Forest Report of 2024), and that the annual loss of forest cover between 2004-2010 was about 1.7% per year.

A satellite comparison mapping conducted for the REDD+ forest reference level revealed a high deforestation rate of 1.94% between 2003 and 2013, but in more recent years, deforestation has been stabilized or slowed down (GoTL 2023). A similar estimated deforestation rate of 1.9% per year during 2016-2021 was reported using satellite imagery by Cho and Lim (2023). These deforestation rates are among the highest in Asia (FAO 2020). In addition, Paudel et al. (2022) suggested that another 0.5% of the remaining forest is being degraded each year. A recent survey of mangrove plantations reported a total remaining area of 645 ha and approximately 129 ha (or 20 %) is considered as highly degraded and difficult to recover (UNDP 2017). The Mutis Timau Forest Complex, a remaining transboundary mountainous tropical forest area, serves as an example of ongoing degradation resulting from unsustainable agricultural practices and firewood collection (Pujiono et al. 2019).

According to the Forest Policy statement (GoTL 2017c), the objective of forest development is to manage forest resources sustainably, particularly in river basins, thereby providing environmental, social, and economic benefits to the people. Forest degradation in mountainous areas has caused substantial soil and rock erosion, as well as debris deposition in riverbeds. This degradation is harming river basin conditions and mangroves due to siltation, which is directly related to water supply for irrigation and, consequently, to food security, including its effects on biodiversity. Hence, the policy objective is to effectively protect the ecological integrity and biological composition, leading to the development of a forest conservation plan to restore forests.

Partial solutions to the loss and degradation of forests lie in plantation forestry for fuelwood, saw timber, and crop trees such as fruit trees, coffee, and high-value timbers. De Carvalho et al. (2022) argued that developing energy plantations is one mechanism for recovering degraded forest lands while providing fuel to villages. Both the Government and funding partners have also recognized the many benefits of agroforestry and have instituted several such programs. UNDP is working to improve community resilience along the Dili to Anairo Road Development Corridor and has increased the area of agroforests by 200 ha.

The MALFF has an ongoing program to plant trees, including for firewood (e.g., *Casuarina*), establish eucalyptus nurseries, and restore mangroves, in addition to a large number of teak plantations. Reducing erosion in deforested river valleys is seen as a priority for forest restoration. To that end, JICA has been assisting communities in the Comoro catchment basin to improve land-use planning and to conduct reforestation along the upland Comoro River, thereby preserving water resources that supply the capital city of Dili and reducing soil erosion and siltation.

The EU “Partnership for Sustainable Agroforestry” was implemented in Timor-Leste with the support of MALFF from 2017 to 2022 to provide benefits through improved employment opportunities in the agroforestry sector. This planting project used a range of high-value species, including mahogany (*Swietenia* spp.), teak (*Tectona grandis*), sandalwood (*Santalum album*), ai-saria (*Cedrella toona*), leucaena (*Leucaena* spp.), rosewood (*Dysoxylum arborescens*),

orange (*Citrus sinensis*), snake fruit (*Salacca edulis),* mango (*Magnifera indica*), and cashew nut (*Anarcadium occidentale*). This latter project planted more than 700,000 seedlings between 2013 and 2019, with a 60% survival rate (UNDP 2019). MALFF's current tree planting objective is for 1 million trees per year, plus an additional 200 ha of mangrove forest recovered by 2024. However, in 2019, only 120,000 seedlings were distributed to 252 individuals across 10 municipalities, with far fewer distributed in each of the three preceding years, and no survival data are available.

Some of the difficulties for planting appear to be uncertain land and water ecosystem tenure, no firm forest estate declared as government forest, uncertain boundaries of community forests, and a lack of maps for areas restored or planted to agroforests (Pers. comm., P.P. Munez). There appears to be no available mapping of restored forest areas, agroforest areas, or the six small formal community forest areas; however, the reported total reforested area was 4,900 ha by 2024 (GoTL 2024). Among agroforest types, the coffee sector is the most important commercial crop, and has in previous years provided up to $45 million from exports (World Bank 2011), but is currently operating far below its long-term potential due to low and volatile production, inconsistent quality, and weak sector management (Paudel et al. 2022), with current exports of about 7000 tons for $14.3 million[16]. Sandalwood (*Santalum* spp.) is a slow-growing but highly valued species that can provide substantial income, although it is now protected.

The opportunity exists to invest in these commercial species to improve local incomes, but such an effort will require considerable government assistance (Rojario et al. 2022, Thu et al. 2023). Training on community forestry practices provides another opportunity to improve the quality of forest management. To that end, FAO has worked with the government, providing education to foresters and communities and developing a national community forest management strategy (FAO 2019). This updated version of the NBSAP builds on these programmes through the national targets that address forest biodiversity.

3.6.5 Protected Areas and Community-based Conservation

The ASEAN Centre for Biodiversity, in the ABO (2023), suggested that expanding protected areas and other effective area-based measures (OECMs), improving governance, and advancing transboundary conservation and nature-based climate mitigation and adaptation were among the key activities that need to be urgently undertaken to reduce biodiversity loss.

A cornerstone of any conservation programme is the use of protected areas. These areas, if well-designed and managed, can protect ecosystems and species, while also offering tourism benefits to local communities. Tourism has been identified as a major government development priority for poverty reduction and for improving rural economic development in

[16] https://oec.world/en/profile/bilateral-product/coffee/reporter/tls#:~:text=In%202021%2C%20Timor%2DLeste%20exported%20%2416.3M%20in%20Coffee.,%2C%20and%20Japan%20(%24902k).

the Timor-Leste Strategic Development Plan 2011–2030 (GoTL 2011) and the National Strategic Plan for Tourism 2012–2017 (Ministry of Tourism 2012). Data from SPREP and MALFF indicate that there are 46 protected areas, covering more than 750 km^2 of marine area and 4,247 km^2 of terrestrial area (GoTL 2024) (**Figure 13, Annex 2**), managed by MALFF. Recently declared marine protected areas include Samba Sembilan in Liquiça (2023), Manufahi (2024), and Atauro Island (2023), bringing the total to 49. These latter three areas have all completed management plans.

Exact area determination and establishment of protected area boundaries are ongoing programs, with 16% of these areas now formally gazetted by the Ministry of Justice. Among the protected areas are two national parks. Most of the terrestrial regions have at least 50% forest cover. However, connectivity among protected areas is being eroded, despite the requirement under the Protected Areas law (Decree Law 5/2016) to sustain connectivity. Landscape planning and development are managed by a directorate within the Ministry of Planning and Statistics, which appears to have overlooked connectivity among protected areas in its road and settlement planning, highlighting the need for enhanced cooperation among departmental objectives.

Grantham et al. (2011) found that 13 of 16 important bird areas (IBAs) and 5 (of 15) important wetlands for birds were located within protected areas. Those located within PAs include Tilomaar, Tata Mailau, Fatumasin, Atauro Island, Sungai Clere, Lore, Mount Paitchao and Lake Iralalaru, Jaco Island, Mount Diatuto, Areia Branca beach and Hinterland, Mount Curi, Irabere Estuary and Tilomar Forest, and Tasitolu. Be Malae-Atabae, Maubara and Mount Mak Fahik/Mount Sarim are outside PA network. In contrast, Grantham et al. (2011) also reported that only one of 5 important area (or KBAs) for orchids, reptiles, and frogs is within protected areas but names are not articulated in the report.

The Nino Konis Santana National Park, a critical PA located at the eastern end of the country, directly supports the livelihoods of approximately 13,900 people from nine villages. The area has at least 730 tree species and three important bird areas, including habitat for the endangered Timor Green-pigeon and the critically endangered Yellow-crested Cockatoo (Da Silva 2021). A METT survey (Triani et al. 2023) at the Park indicated that planning has improved (compared to a 2014 survey), but that staff, budget, equipment, and management facilities are still lacking. On the other hand, the METT survey found that community participation has significantly contributed to the Park's development. A draft management plan is being developed, which, when adopted, will help improve park development.

Conservation International (2019) completed a programme to improve Protected Area management, including expanding the Maurei Lake protected area from 600 ha to 4,677 ha and adding the Alafalu primary forest. However, Da Silva and Bui (2021) found that tourism planning and development in nature reserve areas are hindered by a lack of specific policies, management plans, and strategies at both national and municipality levels, and that the key issues included poor institutional capacity, limited infrastructure, and the need for training. For example, local communities in Timor-Leste lack the environmental knowledge and awareness

necessary to preserve their natural resources and wildlife due to poverty and limited access to education. Further, there are no national guidelines for developing or managing its national parks and protected areas system.

Freshwater ecosystems, though less extensive, are important for livelihoods but remain understudied and underrepresented in the current National Protected Area Network System (Sistema Nacional de Areas Protegidas). The aquatic ecosystems present in Timor Leste can be grouped into four categories of protected areas: marine protected area, aquatic protected area, protected or reserved forest, and wildlife sanctuary. Especially in marine areas, Timor-Leste has several other effective area-based conservation measures (OECMs). Some of these LMMAs have been successful, while others lack sufficient support or access to tourism opportunities. WorldFish and Blue Ventures are actively working with LMMA communities to improve fisheries and reef management. Within the LMMAs and in other areas, approximately 26 “no-take zones” have been established as fish sanctuaries. In Atauro Island, one of the country’s first *tara bandu*-based community-based marine management area, communities impose restricted fishing and anchoring, banned destructive fishing practices and introduction of a reef tax for tourists. Similar *tara bandu*-based management is also practiced in Behau and Beto-Tasi, improving fisheries monitoring and livelihood diversification to enhance community-led marine conservation. Under MALFF, community forests (CFs) have been established in four municipalities, primarily as agroforests, with some of these receiving assistances from the EU, which has promoted the planting of commercial crop species.

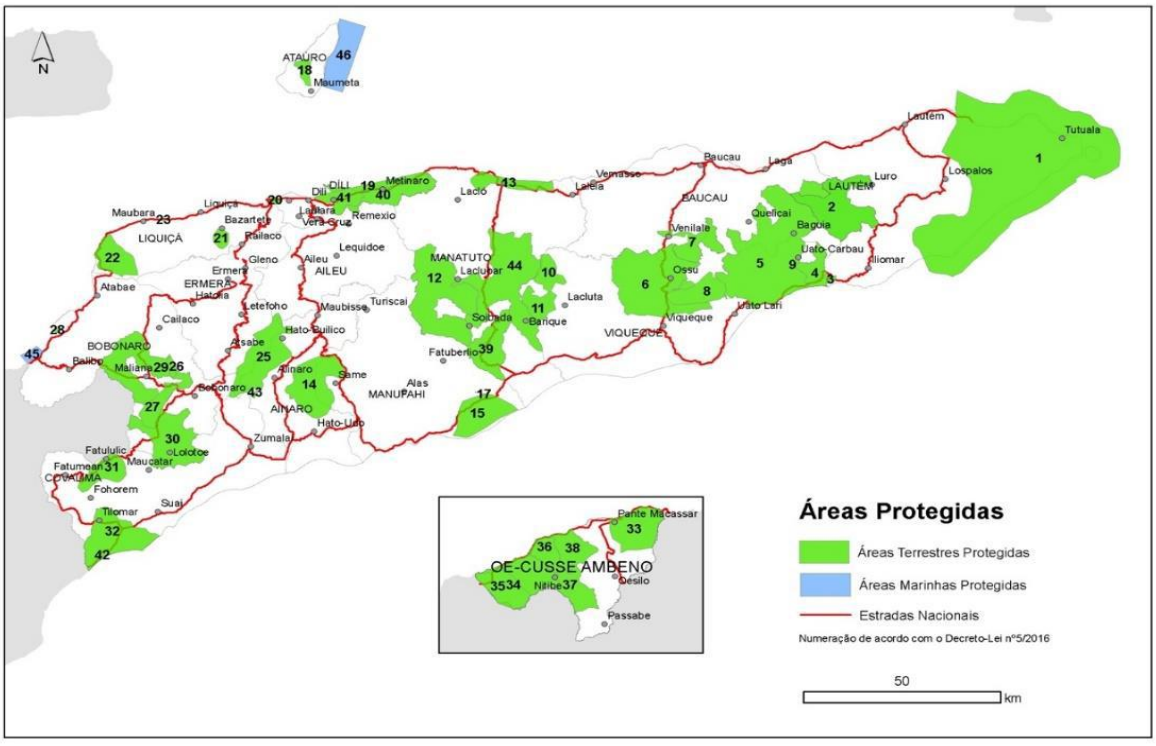


Figure 13. Protected areas in Timor-Leste, excluding OECMs. Map from MEC Decree Law 45/2023. The new national marine park in Liquiçá is not mapped.

4. NATIONAL AND INTERNATIONAL POLICIES RELEVANT FOR BIODIVERSITY CONSERVATION

4.1 The Laws and Policies/Resolutions Supporting the NBSAP

Timor-Leste already has several resolutions, laws, and policies that directly support biodiversity conservation and serve as the basis for a renewed NBSAP (**Table 5**). In particular, the Biodiversity Decree Law was recently passed by Council of Ministers in 2022.

Table 5. Laws and resolutions supporting conservation in Timor-Leste

Laws & policies	Description
Constitution of Timor-Leste	It guarantees the right of every individual to a humane, healthy, and ecologically balanced environment, coupled with the responsibility to protect and enhance it for the well-being of future generations. The State shall recognize the need to preserve and rationalize natural resources and should promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy (Article 61).
The Biodiversity Decree Law (2022)	It was designed to provide a legal framework for the sustainable use of biological resources, promote the conservation of biodiversity, and integrate biodiversity considerations into the development of all national laws, policies, programs, and activities. The legislation is aligned with the requirements of the National System of Protected Areas and the existing Basic Law for the Environment.
Decree-Law 26/2012	Establishing the Environmental Basic Legislation is a wide-ranging law focusing on maintaining environmental health in multiple sectors and states that "it is incumbent upon the State to create a transparent, comprehensive and decentralized environmental monitoring system that can implement integrated pollution control, assess the quality of environmental components, the state of natural resource use and environmental impacts caused by economic activities, and collect the information necessary to comply with this law."
The Environmental Licensing Decree (Law No. 5, 2011)	It creates a system of environmental licensing for public and private projects likely to produce environmental and social impacts on the

	environment.
Decree-Law on the National System of Protected Areas (Decree-Law 5/2016)	It was designed to enable the creation and management of protected areas, with five types of areas defined.
Law No. 6/2017, Basic Law of Land Use Planning and Decree-Law No. 45/2023	National Plan for Territorial Planning together form the basis for large-scale planning on 11 specific areas, covering forest, agriculture, coastal protection, roads, other infrastructure, and protected areas.
Decree-Law No. 35/2021 on Territorial Planning Instruments	This Decree is about Territorial Planning that establishes the legal regime for territorial planning instruments. In particular, it specifies the regime for coordinating the national and municipal context for the territorial management system and the approval, execution and evaluation of territorial management instruments.
National Strategy of Sea Waste Management, Government Resolution 15/2016	It states that marine litter presents itself as a particularly serious threat to human health, biodiversity, and the environment, and assigns departmental responsibilities.
Parliament Resolution 9/2016	Adoption of Urgent Information and Awareness Measures for the Preservation of the Environment recommends the Government adopt 'urgent information and awareness measures for the preservation of the environment', noting the increasing accumulation of waste at sea.
Decree Law 37 Disposal, Import and Production of Bags, Packaging and other Plastics (2020)	It was designed to reduce plastic use in the country. Zero plastic campaign was also initiated in 2019 which is also the ambition of the Decree.
Investment Strategy for Managing Urban Solid Waste in Dili, Government Resolution 32 (2016)	It establishes the rules for urban waste in Dili.
Decree-Law 2/2017 Urban Solid Waste Management System	It sets the foundation for a modern waste management system, including requirements for collection and disposal.
Agriculture Policy and Strategic Framework	It establishes the priorities for the agriculture and forestry sectors.
Decree Law on General Regulations on Fishing	It establishes the rules for the fishery industry, including sustainable fishery management.
The General Forestry Regime and National Forest Policy	It set out departmental responsibilities for forest management and have a section focusing on seeds and tree improvement research.
The Pesticides Decree Law	It regulates the use of pesticides at all stages, including import,

	export, and use, to protect human, animal, and plant health in the marine and terrestrial environments.
Operational Law of Clean Development Mechanism under the Kyoto Protocol (2010), this has been replaced by the Decree Law no. 42/2022 Establishment of AND,I.P.	The Decree has the mandate of covering clean development, emissions trading, and liaison with the Green Climate Fund
Decree Law on Export, Import and Use of Ozone Depleting Substances (Decree Law 36/2012)	It provisions elimination of the import of freons.
Decree Law 45/2023 Land Law	It provides the basis for spatial planning at a large scale (by municipality) and provides a wealth of summary information about the country, its people, and the status of some resources.
Draft Climate change law – draft only 2022	An objective of this law is "the legal framework necessary to develop transparent and long-term climate change mitigation measures and policies that protect and increase the regeneration of ecosystems and biodiversity, and [] increased over time". The law also notes that environmental protection will be ensured (Art. 5.8) and enhancing the environmental protection of land and ocean carbon sinks (Art. 11.3.iv)).[17]

In addition to formal laws, there are traditional customary practices in Timor-Leste that can contribute to conserving the natural resources. A system of communal protection known as Tara Bandu is an agreement among members of a community to protect a resource for a period of time. It is often used to regulate the harvest of agricultural goods, cutting of trees, collecting forest products, hunting certain species, or fishing times and amounts. The system represents a form of public assessment of individuals who have overharvested resources within the community area.

17 https://www.laohamutuk.org/Env/Climate/2023/221222TLClimate%20Change%20Law%20Zero%20DraftEn.pdf?utm_source=chatgpt.com

4.2 Government Institutional Responsibilities for Biodiversity

The following are the Ministries and Departments within those Ministries that are responsible for managing the various aspects/components of biodiversity in Timor-Leste (**Table 6**).

Table 6. Ministries and Departments responsible for managing biodiversity

Ministry of Economic Affairs, Tourism and Environment (MTE)
Environment Department • Directorate General for Environment • National Directorate of Biodiversity • National Directorate of Planning, Finance, and Administration • National Directorate of Education and Information of the Environment Centre • National Directorate of Pollution Control • National Directorate of Climate Change • National Agency for Environmental License (ANLA) • National Designated Authority for Combating Climate Change (NDA) **General Directorate for Tourism** **National Authority for Tourism.**
Ministry of Agriculture. Livestock, Fisheries and Forestry (MALFF)
Directorate General for Corporate Services • National Directorate of Research and Statistics • National Directorate of Policy Planning, Monitoring and Evaluation • National Directorate of Administration and Finance • National Directorate of Human Resources and Legal Support
Directorate General for Agriculture, Coffee, and Industrial Plants • National Directorate of Agriculture, Horticulture and Plant Protection • National Directorate of Irrigation and Water Use Management • National Directorate of Coffee and Industrial Plants • National Directorate of Extension and Agricultural Training
Secretary of State for the Forestry Department

Directorate General for Forestry • National Directorate of Forestry Conservation and Development of Eco-Tourism • National Directorate of Forestry Management, Watershed Management and Mangrove Areas • National Directorate of Community Forest Development • National Directorate of Protection and Forest Guard
Secretary of State of Fisheries **Directorate General for Fisheries, Aquaculture and Aquatic Resources** • National Directorate of Marine Spatial Planning and Aquatic Resources • National Directorate of Fisheries Inspection • National Directorate of Fisheries • National Directorate of Aquaculture • National Directorate of Training and Technical Study of Fisheries and Aquaculture
Secretary of State for Livestock • Directorate General for Livestock and Veterinary • National Directorate of Livestock • National Directorate of Veterinary Services • National Directorate of Technology and Processing of Livestock Products

4.3 Relevant Plans and Policies Produced After 2015

Aside from scientific journal publications (most of which are referenced in this document), there are many advisory reports from agencies working in Timor-Leste, including NGOs, development partners, and the government. These reports address some of the issues brought forward in the 2015 version of the NBSAP. Many other useful and relevant documents were produced before 2015 and are listed in the 2015 NBSAP, including the National Protected Areas Workplan and the Strategic Development Plan. Along with those older reports, the following is a list of important reports consulted for the updated NBSAP, which were produced after 2015, except for the Grantham et al. (2011) national ecological gap analysis that is also included here because it remains highly relevant for planning associated with the new biodiversity targets (**Table 7**). Some of these plans and policies are already described in detail in Section 3.6.

Table 7. Key plans and policies developed by the Timor-Leste government and its allies relevant for NBSAP

Producer	Plans and Policies
Government of Timor-Leste.	2023. Priorities of the lX Government. 2023. Timor-Leste's National REDD+ Forest Reference Level: Submission for UNFCCC Technical Assessment in 2023. 2022. Nationally Determined Contribution: Timor-Leste 2022-2030. 2022 National Climate Change Policy. 2021. National adaptation plan (NAP). 2018. Final Country Report of the Land Degradation Neutrality Target Setting Programme in Timor-Leste. 2018. Final Country Report of the Land Degradation Neutrality Target Setting Programme in Timor-Leste. Ministry of Agriculture and Fisheries. 2019. 6th National Report to the CBD
McCue, J. 2020.	Shoreline Management Adaptation Planning Strategic Action Plan (SAP) and Road Map. Draft Report. Sustainable Seas.
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4.4 Examples of Ongoing Programmes and Projects

This updated NBSAP also took note of the many current regional and national plans and projects, such as the Coral Triangle Initiative (CTI) on Reefs and Fisheries, the Arafura and Timor Sea (ATSEA) Programme, and the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) Regional Programme. Programmes of the many aid and funding partners, and NGOs were considered, such as the JICA project on community resources management and reforesting key watersheds, an EU project on high-value crop agro-forestry and providing technical training, Worldfish's project on fisheries sector support, the USAID work on promoting aquaculture and on plastic recycling, and the Blue Ventures project to promote ecotourism in locally managed marine areas (LMMAs) and coral reef monitoring, along with many others.

The European Union sees a continued need for reforestation in priority degraded areas, in part for carbon farming. Conservation International (CI) is working with local communities to improve the management of marine and terrestrial protected areas. It is particularly involved in lobbying the government to designate Atauro Island as a National Park and to develop a Marine Peace Park with Indonesia. Multiple agencies have taken up the cause of reforestation and/or community resource management, including CI, USAID, JICA, and the EU, along with MALFF, in an effort to reforest river valleys and mangroves, improve landscape connectivity, and enhance communities' capacity to manage their own resources.

Climate adaptation has also been a recent focus, for example, the UNDP-MALFF project on protecting rural communities from climate-induced natural disasters and the UNDP project on 'Green Transformation in the Pacific towards Net-Zero and Climate Resilient Development'. GCF has funded several projects to recover forests, primarily through agroforestry and there is

interest among several development banks and IGOs to conduct further reforestation for carbon farms together with MALFF.

4.5 International Environmental Agreements Signed by Timor-Leste

These international agreements and conventions include:

- Convention on Biological Diversity
- UN Framework Convention on Climate Change
- UN Convention to Combat Desertification
- Vienna Convention for the Protection of the Ozone Layer
- Montreal Protocol on Substances that Deplete the Ozone Layer

As a signatory to these international agreements, Timor-Leste seeks to fulfill its commitments to addressing global environmental challenges while also accessing international financing, technical assistance, and capacity-building mechanisms available under these frameworks. These commitments are reinforced by alignment with the UN Strategic Plan for Forests and the Global Forest Goals, as well as the Glasgow Leaders' Declaration on Forests and Land Use, which emphasize halting deforestation, restoring degraded ecosystems, and promoting sustainable land use. In addition, Timor-Leste is working towards acceding to the Nagoya Protocol on Access and Benefit-Sharing (ABS) of Genetic Resources to strengthen equitable use of biodiversity and associated traditional knowledge.

5. STATUS OF IMPLEMENTATION OF THE NBSAP (2014-2020)

5.1 Overview of NBSAP (2011-2020)

Timor-Leste developed its first NBSAP in 2011 for the period 2011–2020[18] shortly after ratifying the CBD in 2007. The NBSAP outlined national priorities to conserve biodiversity, promote sustainable use of natural resources, and ensure equitable sharing of benefits arising from genetic resources. The NBSAP was revised in February 2015[19]. In the updated NBSAP, the priority strategies for biodiversity conservation are defined in line with the National Strategic Development Plan (2011–2030) and commitments under the CBD.

Through a participatory stakeholder engagement process, five priority strategies were identified, supported by 21 strategic actions. These strategies were designed for short-term initiation and targeted for implementation by 2020, with clearly defined targets and actions. The priority strategies were as follows:

- Mainstream biodiversity into sectoral plans and programs to address the underlying drivers of biodiversity loss.
- Protect biodiversity and promote sustainable use of natural resources.
- Build climate-resilient ecosystems through effective management of protected areas and reduction of threats to biodiversity.
- Enhance biodiversity and ecosystem services to secure benefits for all communities.
- Strengthen NBSAP implementation through participatory planning, knowledge management, and capacity building at national, municipality, sub-municipality, and community levels.

Progress was reported through Timor-Leste's 5th and 6th National Reports to the CBD, which highlighted advances such as the legal framework for environmental protection, designation of new protected areas, and integration of biodiversity into planning. However, challenges remain in enforcement, financing, data availability, and mainstreaming biodiversity across all sectors. These lessons should be used to ensure that the updated NBSAP is more realistic, better prioritized, and more implementation-oriented.

[18] https://timorleste-data.sprep.org/system/files/TLBiodiversityActionPlanOct2011en-1.pdf
[19] https://www.cbd.int/doc/world/tl/tl-nbsap-v2-en.pdf

5.2 Status of Implementation of the NBSAP

Timor-Leste's first NBSAP (2011–2020) provided an important framework for conserving biodiversity, expanding protected areas, and integrating biodiversity into national development. According to the 6th National Report (2020) to CBD, progress has been made in several areas. Timor-Leste established a legal and institutional framework for environmental governance, including the Environmental Framework Law (2012) and the Decree-Law on Environmental Licensing (2011). A significant step forward was the establishment of the National Protected Area System (Decree-Law No. 5/2016), which formalized management of terrestrial and marine ecosystems. As of the report, 46 protected areas had been declared, covering diverse habitats such as forests, coral reefs, and mangroves.

The 6th National Report also highlighted progress in policy integration and mainstreaming. The NBSAP was linked to the Timor-Leste Strategic Development Plan and cross-sectoral initiatives in agriculture, fisheries, forestry, and tourism. Biodiversity considerations have been partially integrated into climate change adaptation, land degradation, and disaster risk reduction strategies. National reports emphasized efforts to strengthen institutions, improve environmental education, and enhance community-based natural resource management, including reforestation and mangrove rehabilitation activities. Development partners and GEF-supported projects contributed to these gains, particularly in catchment management and restoration initiatives.

Under the NBSAP (2011-2020), the government raised awareness of the importance of biodiversity for these services among more than 3,100 people in many villages. These numerous services also include those whose livelihoods are based on tourism (World Bank, 2018), which remains an ongoing priority for Timor-Leste, as outlined in the National Sustainable Development Plan (GoTL, 2010) and the National Tourism Policy (GoTL, 2017). A priority strategy of the 2015-2020 NBSAP was to provide education in support of ecotourism, which was delivered to more than 300 people.

5.3 Implementation Gaps

Despite some achievements, the implementation of the NBSAP has faced serious challenges. Data availability remains a major barrier. Baseline information on ecosystems and species is incomplete, monitoring systems are still not sufficiently robust to detect changes, and many indicators are difficult to measure. While protected areas have been declared, many lack adequate staff, management plans, or financial resources, leading to so-called "paper parks." Moreover, stakeholders are also not aware of the establishment of new Protected Areas. Enforcement of existing environmental regulations is also limited, reflecting capacity constraints and overlapping institutional mandates.

Financing is another persistent issue. Much of the implementation has relied on donor-funded projects, while domestic budget allocations for biodiversity conservation remain insufficient.

Harmful subsidies and incentives that undermine conservation goals remain unaddressed. Stakeholder engagement, especially with IPLCs or local communities[20], the private sector, and local governments, has been uneven, leaving gaps in inclusivity and ownership. Overall, the NBSAP has made moderate progress: it successfully established the legal and policy frameworks, raised awareness, and initiated important conservation projects. The revision of the NBSAP for 2026–2030 now provides an opportunity to build on these foundations, close gaps in enforcement and financing, strengthen monitoring and evaluation, and ensure broader participation. Aligning with KMGBF and SDGs will also help Timor-Leste position biodiversity at the core of its sustainable development agenda.

The 2011–2020 NBSAP of Timor-Leste made significant progress in outlining strategies for biodiversity conservation but paid limited attention to gender equality, disability, and social inclusion (GEDSI). Gender was not mainstreamed across the strategic goals, actions, or indicators, meaning that the different roles, responsibilities, and knowledge of women and men regarding biodiversity were not fully recognized. For instance, although women are heavily engaged in subsistence agriculture, forest product collection, fisheries activities, and coastal resource use, the NBSAP did not establish gender-responsive targets or mechanisms to track women's participation and benefits.

Similarly, while the NBSAP highlighted community participation in general terms, it lacked specific provisions for local communities. Traditional knowledge systems, cultural values, and customary practices, which are critical for sustainable biodiversity management, were acknowledged but not systematically integrated into biodiversity planning, implementation, or monitoring frameworks. As a result, opportunities to strengthen conservation outcomes through local and indigenous practices were underutilized.

Beyond gender and LCs, the NBSAP did not adequately address broader social inclusion dimensions, such as the involvement of youth, elderly people, or persons with disabilities (PwD). These groups often face structural barriers to participation but were not explicitly targeted in the NBSAP's strategies or actions. The absence of inclusive planning mechanisms meant that biodiversity benefits were not always equitably shared, particularly with vulnerable groups who depend most directly on natural resources for their livelihoods.

Institutional capacity and awareness gaps also constrained the integration of GEDSI. The institutions tasked with implementing the NBSAP lacked training, tools, and resources to mainstream gender and inclusion. This limited their ability to design interventions that could address differentiated needs or promote equitable access to biodiversity benefits.

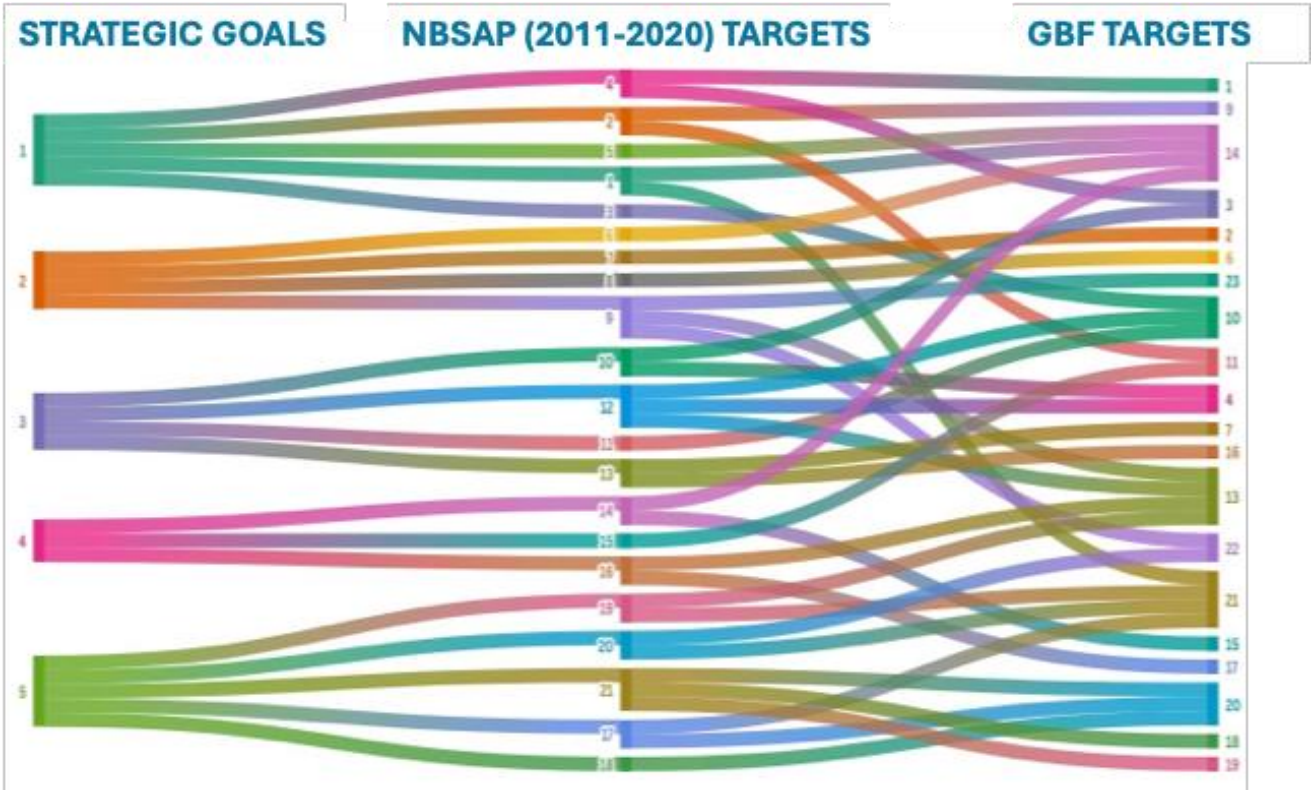
As a result, while the NBSAP provided a useful framework for biodiversity conservation, its weak GEDSI integration reduced effectiveness and equity. The updated NBSAP offers an

[20] In one of consultation meetings, stakeholders agreed to use the term 'local community' instead of IPLC since the country doesn't have indigenous peoples *per se*. Hence, here onward, local community has been used but that is equivalent to IPLC in KMGBF and CBD.

important opportunity to address these shortcomings by embedding gender-responsive targets and indicators, ensuring local community participation through mechanisms such as free, prior, and informed consent (FPIC)[21], and aligning with national frameworks like Gender Analysis Thematic Report: A Key Milestone in Advancing Gender Equality and Women's Empowerment (2025). Doing so would not only strengthen biodiversity outcomes but also ensure that the benefits of conservation are more inclusive and equitably shared.

5.4 NBSAP (2011-2020) Alignment with KMGBF Targets

To ensure the new NBSAP aligns with KMGBF, it is important to assess the existing NBSAP's alignment with KMGBF. At the strategic level, the NBSAP (2011-2020) builds on Timor-Leste's Strategic Development Plan (2011–2030) and integrates cross-sectoral policies. Moreover, the NBSAP (2011–2020) was developed in line with the Aichi Biodiversity Targets (2011–2020), following the same timeframe and global priorities. However, goals and targets not only align with the Aichi Targets but also with the KMGBF targets (**Figure 14**).



[21] Free, Prior and Informed Consent (FPIC) is a human rights–based principle that affirms the right of Indigenous Peoples and, increasingly, local communities **to** give or withhold consent to decisions, projects, laws, or policies that may affect their lands, territories, resources, livelihoods, cultural heritage, or traditional knowledge**.**

Figure 14. Alignment of NBSAP (2011-2020) targets with KMGBF Targets (self-drawn based on self-analysis and interpretation of NBSAP (2011-2020) and KMGBF Targets) prepared using an online tool called Flourish

This analysis was important to understand which KMGBF Targets are already prioritized by the country and what are missing, so need to be considered in the updated NBSAP. For instance, the 2011-2020 NBSAP's focus on expanding and effectively managing protected areas and community conservation zones corresponds directly with KMGBF Target 3 (protecting 30% of terrestrial, inland water, and marine areas by 2030). Similarly, actions to restore degraded forests, mangroves, and watersheds contribute to KMGBF Target 2 (restoring at least 30% of degraded ecosystems). None of the previous NBSAP targets was aligned with KMGBF Targets 5, 8 and 12, so targets and actions related to those KMGBF targets were duly considered in the updated NBSAP.

The updated NBSAP (2026–2030) is fully aligned with KMGBF. NBSAP Targets 1 to 21 corresponds directly to KMGBF Targets 1 to 21, while NBSAP Target 22 consolidates and reflects KMGBF Targets 22 and 23. At the international level, the updated NBSAP aligns with and will contribute to the "Decade of Action" to deliver SDGs, the UN Decade of Ocean Science for Sustainable Development, the UN Decade on Ecosystem Restoration, and the UN Global Forest Goals. Monitoring of the NBSAP will also be linked to other reporting requirements, including those for CITES, the UNFCCC, UNCCD, and the Ramsar Convention.

6. NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (2026-2030)

6.1 Consultation Process and Framework of NBSAP

Building on the lessons of the NBSAP (2011–2020), the updated NBSAP adopts a whole-of-government and whole-of-society approach. This includes active engagement with government ministries, LCs, civil society, the private sector, academia, and development partners. Mechanisms for participatory planning, gender equality, and social inclusion are embedded to ensure that biodiversity management benefits all groups equitably. The consultation process was designed to be inclusive and participatory, engaging representatives from national and sub-national government institutions, civil society, academia, the private sector, and Indigenous Peoples and local communities.

A regional consultation meeting was held in Baucau in November 9-10, 2023, to discuss targets and develop suitable actions for each. The meeting was attended by representatives from the government and local and international NGOs. Other subsequent consultations involved development partners and many NGOs that were unable to participate in the consultation meeting. The subsequent regional stakeholder consultation meeting was held in Baucau, April 4-5, 2024. At that meeting, the attendees further edited the country's targets, finalized the selection of actions for each target, and validated the indicators. Some of the KMGBF targets were accepted as they were and retained as Timor-Leste targets, typically with minor wording changes. For example, there are no formally recognized indigenous peoples in Timor-Leste (Government staff, personal communication, Baucau NBSAP meeting, November 2023), so the term was removed from the relevant targets and replaced with the term 'local communities'.

The third regional consultation meeting was held on 6 October 2025 in Manufahi, bringing together 67 stakeholders from diverse backgrounds. Participants included municipal authorities, *suco* leaders (also known as *Chefes de Suco* or village leaders), women's groups, youth organizations, fisher associations, farmers, academics, non-governmental organizations, and technical staff from MALFF and MTE. This broad representation ensured that voices from rural, coastal, and resource-dependent communities were adequately reflected in the updated NBSAP. Participants shared local knowledge on biodiversity status, key drivers of biodiversity loss, community-based management practices, livelihoods' dependence on natural resources, and priority actions at the municipal level. These inputs provided valuable insights into local challenges and opportunities, particularly regarding agriculture, fisheries, forests, freshwater resources, and climate vulnerability.

Following this, a national-level stakeholder consultation workshop was held in Dili on 8 October 2025, with the participation of 83 representatives, to review and enrich the draft NBSAP. Participants discussed biodiversity challenges, conservation gaps, targets, suitable actions, GEDSI and local community issues, stakeholder roles, capacity-building needs, and sustainable financing. The meetings were attended by representatives from the government and local and international NGOs. Bilateral consultation meetings were also held with funding partners, NGOs, the private sector, and government officials, including the Directors General of the forestry, fisheries, tourism, and finance sectors.

Following these consultations, the NBSAP draft was updated and presented at a regional stakeholder consultation held on 9 December 2025 in Liquiça. This meeting gathered additional inputs from local participants on site-specific challenges, ongoing initiatives, and potential biodiversity conservation actions not reflected in the draft. Participants were also invited to identify actions they considered unrealistic or not relevant. All feedback was reviewed and integrated into the revised draft.

Subsequently, a national validation workshop was held on 11 December 2025 in Dili to present the updated NBSAP to national-level stakeholders. Participants were asked to assess the relevance, feasibility, and completeness of the proposed targets and actions, identify any gaps, and provide final comments. The workshop served to validate the draft NBSAP prior to its finalization. Details of different workshops held are presented in **Annex 3**.

The updated NBSAP provides a comprehensive strategic framework to guide biodiversity management in Timor-Leste, ensuring consistency with national development priorities and alignment with international commitments. Crucially, the framework translates KMGBF into national action by aligning Timor-Leste's strategies and targets with the KMGBF's four goals and 23 targets. Targets 1-21 of KMGBF and NBSAP align exactly with each other, while the NBSAP merges KMGBF 22 and 23 and names it Target 22, thus making 22 total targets. In addition, the framework is designed to reinforce coherence with other key policies, such as the NDC under the Paris Agreement, the National Adaptation Plan (NAP), Land Degradation Neutrality (LDN) commitments, and regional initiatives such as the Coral Triangle Initiative. Through this integrated and forward-looking approach, the NBSAP provides Timor-Leste with a robust roadmap for conserving biodiversity, advancing national development, and fulfilling its global environmental obligations.

6.2 The Vision, Goal, and Scope of NBSAP

The vision for the sustainable use of biodiversity stated in the NBSAP (2011-2020) still applies to the new NBSAP (2026-2030), which is as follows:

> ***"By 2030, Timor-Leste's biodiversity and ecosystems are conserved and sustainably used by all sectors, providing food security and contributing to poverty eradication and improved quality of life for all Timorese People."***

The overarching goal of the NBSAP is to conserve and sustainably use Timor-Leste's biodiversity and ecosystems as a foundation for food security, poverty reduction, climate resilience, and inclusive national development. The NBSAP thus positions biodiversity conservation as a cornerstone of sustainable development, supporting national goals of reducing poverty, ensuring food security, building climate resilience, and promoting inclusive economic growth. It emphasizes integrating biodiversity across key sectors, including agriculture, forestry, fisheries, tourism, and infrastructure, while safeguarding the integrity of ecosystems and traditional knowledge systems. It identifies biodiversity as both a national asset and a driver of resilience, directly linking ecosystem health to the well-being of communities and the country's long-term development trajectory.

Priorities of NBSAP include expanding and effectively managing protected areas, restoring degraded ecosystems, mainstreaming biodiversity into productive sectors, strengthening safeguards and governance, reforming harmful incentives, and mobilizing sustainable financing. The plan presents opportunities to link biodiversity conservation with economic gains, for example, through improvements to protected areas, marine tourism, alternative livelihoods, community-based resource management, energy plantations, agroforestry, and recycling. Some actions are already being addressed, at least in part, and are noted as "ongoing".

6.3 Priority Targets and Actions of NBSAP

The NBSAP sets out twenty-two interlinked targets that collectively guide Timor-Leste's pathway toward conserving biodiversity, restoring ecosystems, and ensuring the sustainable use of natural resources. Fully aligned with the KMGBF and SDGs, the targets focus on integrating biodiversity into national planning and productive sectors, restoring degraded terrestrial, freshwater, coastal, and marine ecosystems, expanding and effectively managing protected and conserved areas, strengthening species protection and biosecurity, and reducing pollution and unsustainable exploitation. Equally, the NBSAP emphasizes actions such as sustainable financing, capacity building, inclusive governance, gender equality, and biodiversity monitoring to ensure that conservation directly contributes to food security, climate resilience, and improved livelihoods for all Timorese people. The targets are presented below, along with the associated critical issues. Actions are given under each Target in **Table 8**.

Target 1. Biodiversity-inclusive Spatial Planning

By 2030, ensure that all areas are under integrated, biodiversity-inclusive spatial planning and effective management to address changes in land and sea use, particularly by reducing the loss of areas of high biodiversity importance and ecosystems with high ecological integrity, while respecting the rights of local communities.

This target responds to weak land- and sea-use planning and governance, which has driven extensive biodiversity loss. Globally, land-use, particularly agricultural expansion, has been the primary driver of declines in terrestrial and freshwater biodiversity since 1970. These pressures

are often uncoordinated, such as roads placed too close to protected or key biodiversity areas. Strong spatial planning is therefore needed to balance development, conserve biodiversity, and uphold community rights.

Timor-Leste's waters form part of a major migration corridor for whales, including blue whales. Although marine spatial plannings exist through initiatives such as the Arafura and Timor Seas Ecosystem Action Programme (ATSEA) and the South Pacific Regional Environmental Programme (SPREP), implementation requires stronger financing, capacity, and community partnerships. On land, less than 2% of primary forest remains, while over 869,000 ha consist of early successional forest. The absence of landscape-level spatial planning, partly due to data gaps, continues to threaten the long-term sustainability of forests and agricultural systems. The target directly supports SDGs 14 and 15, with contributions to SDGs 1, 6, and 12, Global Forest Goal 5, and the Glasgow Leaders' Declaration on Forests and Land Use. Key actions under this target are as follows.

Actions

- **1.1.** Develop maps of ecosystem integrity, forest connectivity, biodiversity hotspots, as well as priority degraded areas for targeted spatial planning to improve ecological connectivity, by integrating gender-disaggregated data on land tenure security, access to natural resources and technologies
- **1.2.** Develop and implement land, coastal, and sea conservation and use plans using integrated and landscape approaches to reduce negative impacts on biodiversity, with gender-balanced participation in planning and decision-making bodies and a minimum of 30% women in consultations
- **1.3.** Develop and implement Marine Spatial Planning within the framework of the 'Blue Economy' to ensure a clean, healthy, productive and biologically diverse marine area
- **1.4.** Develop a possible partnership with UNESCAP and other relevant organizations for the remote sensing of land and seascapes to assist in spatial planning and populating indicators of connectedness

Target 2. Restoration of Degraded Areas

By 2030, degraded areas of forests, agricultural lands, inland waters, and coastal and marine areas are mapped and 20% are restored to improve biodiversity, connectivity, and ecosystem integrity.

Land and ocean degradation occur when ecosystems can no longer provide essential goods and services, most of which depend on healthy biodiversity. Globally, major drivers include cropland and grazing expansion, unsustainable farming and forestry, climate change, infrastructure growth, and extractive industries. In coastal and marine areas, degradation is largely caused by sedimentation from upland deforestation, overfishing, destructive fishing methods, and pollution.

In Timor-Leste, unsustainable agriculture is the leading cause of land degradation, alongside historical overharvesting of forests and continued reliance on fuelwood. The country

experiences high annual deforestation (1.9%) and degradation (0.5%), and much arable land is deteriorating due to unplanned agricultural expansion and invasive species. Although priority restoration zones are not fully mapped, eroding river valleys are known hotspots. Detailed actions for terrestrial and marine recovery are expanded under Targets 7 and 10. Marine degradation mainly stems from plastic pollution, estuary sedimentation, mangrove loss, and possible overfishing. Weak data on marine resource status limits full assessment. However, LMMAs have strengthened community-based monitoring and zoning, and national progress has been made in mapping mangroves, reefs, and ecosystem types. Priority areas for ocean restoration still need to be identified. This target supports SDGs 1, 2, 14, and 15, Global Forest Goals 1, 2, and 5, and the Glasgow Leaders' Declaration on Forests and Land Use. Key actions under this target include:

Actions

- **2.1.** Develop a revised forest cover and degraded areas map and complete the mapping of degraded coastal and marine areas
- **2.2.** Plant 1 million trees per year (>600 ha/year) in priority degraded sites including in deforested watersheds, to increase landscape connectivity and habitat quality, ensuring at least 30% women's participation among labourers (Ongoing MALFF programme)
- **2.3.** Recover 200 ha of mangrove forest annually and promote community-led conservation and mangrove stewardship by adopting public-private partnerships
- **2.4.** Complete restoration planning in 3 watersheds: Kamora River, Ninura River, and Mota-Masin River (Ongoing MALFF programme)
- **2.5.** Recover soil function through the expanded use of organic fertilisers and restore 500 ha of degraded farmland and wilderness

Target 3. Protected Areas Management in Land, Waters and Seas

By 2030, ensure at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of PAs and other effective area-based conservation measures, and integrated into more expansive landscapes and seascapes, while ensuring that sustainable uses are fully consistent with conservation outcomes, recognizing and respecting the rights of local communities.

Protected Areas (PAs), when properly planned, managed, and enforced, are globally recognized as one of the most effective tools for conserving biodiversity. Well-managed PAs and OECMs also support local communities in restoring and sustaining ecosystems. In Timor-Leste, about 16% of land is under protection, and marine protected areas cover 678 km², but most sites lack approved management plans and clear boundary demarcation. While LMMAs have been successfully established and are expanding with NGO and international support, the wider PA system requires much stronger government investment to avoid becoming "paper parks."

Strengthening PAs is also central to Timor-Leste's tourism agenda. Integrating PA management with tourism development can enhance biodiversity protection while supporting local livelihoods. Current government priorities include expanding PAs on Atauro Island, establishing a marine peace park, and exploring an international marine park with Indonesia. However, the absence of finalized management plans and incomplete boundary definitions remains a major constraint. This target links to Target 1 on ecological connectivity and Target 2 on forest restoration. It directly supports SDGs 14 and 15 and Global Forest Goals 1 and 3, which emphasize sustainable management of terrestrial and marine resources and protected areas. Key actions include:

Actions

- **3.1.** Finalize and implement the management plans and governance systems for all National Parks and 3 other protected areas in consultations with local communities (Ongoing MALFF programme)
- **3.2.** Continue working towards creating protected areas at Manatuto, Baucau, and Covalima
- **3.3.** Continue efforts to create an International Marine Peace Park with Indonesia (Ongoing MALFF programme)
- **3.4.** Improve visitor services at Nino Konis National Park and at Kayrala Xanana Gusmao National Park to improve the attraction to tourists, in part through further training of local communities for park management
- **3.5.** Establish at least 10 new LMMAs and 300+ ha of new community forest, with 3 CF committees established
- **3.6.** Assist LMMAS and CFs near PAs to achieve Asean CBT certification to encourage ecotourism, ensuring balanced participation of women and men in CBT training, decision-making, and certification, and gender-responsive benefit-sharing mechanisms
- **3.7.** Finalize the Atauro National Marine Park and conduct a biodiversity assessment to include mapping of coral reefs at the Park (Ongoing MALFF programme)
- **3.8.** Conduct connectivity and gap analyses, biodiversity loss and gain assessment and biodiversity indices analysis of PAs and OECM
- **3.9.** Establish buffer zones and integrate small and adjacent PAs to improve connectivity
- **3.10.** Establish a multi-stakeholder, gender-balanced, protection area management authority and community conservation committee for 47 identified locations, consisting of government, municipal authorities, and local community representatives
- **3.11.** Train PA staff in sustainably PA management and governance and monitoring performance and changes of PAs with time
- **3.12.** Designate new marine PAs to reach to a total of 23

3.13. Complete a national strategy and action plan, along with Standard Operating Procedures (SOPs) and business plans on the sustainable development of protected areas

3.14. Conduct biennial Protected Area Management Effectiveness Tracking Tool (METT) to monitor change and aid adaptive management for addressing existing gaps and link results with performance-based funding, ensuring women's participation in METT assessments

Target 4. Protecting Threatened Species and Genetic Diversity

By 2030, threatened species and genetic diversity will be protected through the development of a formal process to list threatened species, develop prevention, management and recovery plans for endangered or critically endangered species through in situ and ex situ conservation and sustainable management practices, and reduce human-wildlife conflicts.

More than 420,000 species are now listed by the IUCN as vulnerable or worse, with most declines driven by human activities. These losses also erode genetic diversity, which is essential for the stability, adaptability, and long-term resilience of species and ecosystems. Genetic diversity enables crops and other organisms to adapt to climate change, whether through natural selection, breeding, or biotechnology, ensuring continued ecosystem functioning and food security. Targeted, species-specific management and conservation measures will therefore be necessary to safeguard threatened species and maintain their genetic resources. At the national level, the number of vulnerable or worse IUCN-listed species now exceeds 72, with the majority being marine species. There is no formal mechanism for listing threatened species, nor are there any recovery plans in place for important species, such as several groupers and endangered birds that are priorities for the country. This target contributes to SDGs 14 and 15. Key actions are as follows.

Actions

4.1. Appoint a threatened species expert committee with a term of reference to (i) compile and examine the evidence for the status of possible threatened species and (ii) to propose species for protective listing to government based on the best available evidence

4.2. Develop and implement Monitoring and Recovery Plans for 10 priority endangered species, engaging women in field monitoring and community awareness activities, and promoting equitable benefit sharing

4.3. Determine the critical habitats for all species listed as threatened or endangered

4.4. Capture 100% of the critical habitats for terrestrial threatened species and 50% of the habitat of marine threatened species in at least one protected area (Ongoing MALFF programme)

4.5. Improve enforcement of existing regulations to protect threatened species by hiring and training additional staff, recruiting and training women as enforcement officers and ensuring gender-sensitive workplace policies and safety measures
4.6. Establish a National Centre for Cetacean Regulation, Research, and Control. (cf. Target 10)
4.7. Develop strategy for maintaining and restoring the genetic diversity of native, wild and domesticated species in situ
4.8. Strengthen the national genebank through advanced management tools and techniques in regeneration, multiplication and maintenance ex situ

Target 5. Sustainable Harvest, Trading, and Use of Wild Species

Management plans are being completed and implemented for commonly harvested wildlife species (marine and terrestrial) are being completed and implemented by 2030, with a focus on those that are overexploited and commercially traded, through direct consultation with local communities.

Over-exploitation of species is the largest direct driver of biodiversity loss in marine ecosystems, and the second most important cause in terrestrial and freshwater ecosystems. Often, exploitation is carried out illegally, despite regulations in place to prevent it. Regulations are ineffective due to poor enforcement. Often, too, local people can unknowingly over-exploit local resources in the absence of information indicating that declines are becoming widespread. Furthermore, illegal commercial demand for certain wildlife species is contributing to extinctions and rarity, thereby increasing prices. Such is the case with naturally produced agarwood (*Aquilaria spp*.), for example, where a kilogram may be worth as much as US$100,000.

Hunting by local communities should be managed through a transparent, negotiated process to enable sustainable wildlife management. In Timor-Leste, many communities continue to hunt and fish traditionally as part of their livelihoods. Furthermore, most villages are located in remote areas, making the enforcement of any regulations challenging. Again, with training and consultative approaches, it may be possible to establish a *tara bandu* system in organized communities. Priorities are to work directly with communities to improve species management, implement formal CFs and LMMAs, and to better understand which species (marine and terrestrial) are being over-exploited. This target has a direct bearing on SDGs 1, 2, 14, and 15. The following actions are planned under this target.

Actions

5.1. Provide training, develop data, and an understanding of which species are hunted/fished, the rates of harvesting of each species, and which species are declining in collaboration of communities, ensuring gender-balanced participation (minimum 30% women) and inclusion of women's traditional knowledge and gender-specific roles in resource use

5.2. Develop mechanisms and increase enforcement to reduce harvests of over-exploited species, including through the use of Tara Bandu, and closed areas in collaboration of LMMAs and CFs promoting alternative livelihoods that address gender-specific dependence on marine and forest resources (Ongoing MALFF programme, with WorldFish and Blue Ventures)

5.3. Conduct inclusive stakeholder consultation/socialization of the National Biodiversity Law/Decree and Wildlife Conservation Law

5.4. Build Crocodile Management Parks, increasing beach safety while conserving the species and promoting the tourist attraction of an animal that is a formal symbolic representation of Timorese identity

5.5. Develop policies, action plans, and legal frameworks for the management of selected wild species harvested for local economy and livelihood using ecosystem approach

5.6. Develop legislation and monitoring, control and surveillance systems to combat Illegal, Unreported and Unregulated (IUU) fishing and to mitigate human-crocodile conflict and implement using community-led initiatives and mechanisms like fishing committees.

Target 6. Reducing impact of invasive species on biodiversity

Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent, by 2030, eradicating or controlling invasive alien species especially in priority sites.

Invasive species, introduced into novel ecosystems, are a direct driver of biodiversity loss. For many island ecosystems, invasive alien species are the leading cause of biodiversity decline. Invasive alien species affect biodiversity by competing with native species for resources, through direct predation, altering habitats, or introducing pathogens. In addition to their environmental impacts, invasive alien species can threaten food security, human health, and economic activities. Globalization and an associated increase in human-mediated activities, such as international transport, trade, and tourism, are the main vectors of introduction. Timor-Leste already has numerous invasive species that have affected habitat quality and agricultural production, although there are no quantitative data on the areas affected. Priorities for actions on invasive species include determining the extent of damage caused by the various species and implementing stricter controls to prevent further introductions. This target contributes to SDGs 2, 14, and 15. Key actions are as follows.

Actions

6.1. Identify priority invasive species and pathways in critical sites (at the national and transboundary scales) and assess their impacts on ecosystems and biodiversity

6.2. Develop and implement plans for prevention of new species and develop control or eradication measures for priority invasive species

6.3. Provide training to Customs Department staff on alien invasive species prevention, at least 30% women's participation, inclusive training arrangements, and awareness of gender-differentiated livelihood impacts

Target 7. Reducing pollution and soil nutrient loss

Reduce chemical pollution and soil nutrient loss by 50%, increase recycling of waste products, and substantially reduce marine and coastal plastic pollution by 2030

Pollution refers to contaminants of various kinds that are introduced into the environment, resulting in instability or harm to ecosystems, including biodiversity and human health. Globally, pollution from nutrients, such as nitrogen and phosphorus, pesticides, hazardous chemicals, and plastics has been found to have particularly harmful impacts on biodiversity and ecosystem functions and services. While there is minimal industrial pollution in Timor-Leste, poor agricultural practices, erosion, and nutrient loss caused by deforestation, and the accumulation of waste plastics are significant sources of pollution. In particular, because tourism is an important economic priority for the government, the accumulation of plastic and rubber along coastal areas, on beaches, and on reefs is of great concern. Resolving this issue requires stronger legislation on the import of all types of plastic, placing the onus for the collection of used materials on vendors and producers, and significantly improved enforcement to reduce littering. This target contributes to achieving SDGs 6, 11, 14, and 15. Key actions are as follows.

Actions

7.1. Improve controls on import and sales of chemical pesticides and increase the use of biological controls and natural pesticides such as Neem, diatomaceous earth, and bacterial insecticides

7.2. Establish an environmental laboratory to conduct environmental testing (e.g., for hazardous substances in marine organisms), inspection, monitoring, and enforcement, making sure recruitment and training of women as lab technicians and inspectors and gender balance in technical staff appointments

7.3. Develop extension programs on the use of alternative herbicides, insecticides and natural fertilizers for communities

7.4. Develop a system of deposit and collection for recycling to reverse the onus for plastic waste to the producers/sellers/importers/retailers rather than on the consumers, including women entrepreneurs in waste collection and recycling and promoting safe and equitable employment opportunities

7.5. Work to improve ‘Decree Law 14⁄2017 Customs Code’ that currently has no articles or provisions directly preventing plastic pollution, including enforcement measures that clearly articulate how enforcement will be carried out

7.6. Develop regional partnerships for recycling and development of regional plastic pollution elimination and recycling plans through international level collaborations, supporting women-led enterprises and addressing financial access barriers for women entrepreneurs

7.7. Create and strengthen policies or laws to prevent pollution in estuaries, beaches and at sea, and implement the "Zero Plastics Policy"

7.8. Raise community awareness of how to ‘Reduce, Reuse, and Recycle’ by organizing Communication, Education and Public Awareness (CEPA) campaigns by engaging women and youth groups

Target 8. Building resilience to climate change

Continue to minimize the ongoing impacts of climate change and ocean acidification on biodiversity and increase ecosystem resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solutions and/or ecosystem-based approaches.

Climate change is affecting all ecosystems through rising temperatures, shifting rainfall patterns, ocean acidification, and sea-level rise. Although countries are working to reduce greenhouse gas emissions under the UNFCCC, climate impacts will continue, making adaptation, mitigation, disaster risk reduction, and the use of nature-based or ecosystem-based solutions essential for protecting ecosystems and livelihoods. As a small island developing state, Timor-Leste is highly vulnerable to sea-level rise, coral bleaching, and climate-related hazards, despite contributing minimally to global emissions. The country’s priority is adaptation, particularly through mangrove and forest restoration. At the same time, extensively degraded and deforested areas provide opportunities for global mitigation through reforestation.

Carbon farming initiatives are emerging, but should follow an ecosystem-based approach that prioritizes biodiversity conservation alongside carbon storage. In agriculture, improving crop varieties and promoting sustainable practices are critical for maintaining productivity under climate stress. Effective forest restoration may also generate biodiversity credits that certify conservation outcomes and can be sold to offset development impacts, providing a potential financing stream. Mitigation and adaptation actions under Target 8 should therefore consider these opportunities. This target supports SDGs 2, 13, 14, and 15 and aligns with the UNFCCC Paris Agreement. Key actions include:

Actions

8.1. Conduct integrated climate vulnerability assessments and develop integrated climate adaptation plans for Ministries and departments including forests, agriculture, environment to minimize climate change impacts (Ongoing programme) and continue

with second phase of assessments at the village level, ensuring women's participation in adaptation consultations (at least 50% in rural areas), integration of gender-disaggregated vulnerability data, and strengthened institutional capacity to collect sex-disaggregated environmental data

8.2. Continue reforestation as both mitigation and adaptation to climate change, including reforesting degraded river valleys and other areas requiring soil protection (Ongoing MALFF programme and see Action 4)

8.3. Research, produce, and provide seeds for key crops (maize, rice, pulses) adapted to a drier, warmer climate to communities to improve agricultural outputs, including by conserving local varieties to avoid genetic erosion (Ongoing MALFF programme)

8.4. Conduct carbon farming projects using ecosystem-based approaches to improve landscape connectivity, restore heterogeneous forests, recover mangroves, wetlands, grassland, seagrass meadows, and taking into account conservation and restoring biodiversity by adopting Blue Economy principles

8.5. Integrate and mainstream biodiversity and climate change into national and sectoral plans and establish cross-ministerial coordination platform

Target 9: Sustainable management and use of wild species

By 2030, ensure the sustainable management and use of wild species and other biological resources in Timor-Leste to deliver equitable social and economic benefits for local communities, especially those most dependent on biodiversity, through sustainable biodiversity-based livelihoods, while safeguarding customary practices and traditional knowledge

Biodiversity is central to livelihoods, food security, cultural identity, and climate resilience in Timor-Leste, particularly for rural, coastal, and Indigenous communities that depend directly on wild species and other biological resources. However, the social and economic benefits derived from biodiversity use have not always been equitably realized, and customary practices, traditional knowledge, and the roles of women and youth are often insufficiently recognized in formal planning, financing, and decision-making processes.

This target operationalizes KMGBF Target 9 by promoting the sustainable management and use of wild species and biological resources in ways that deliver fair and inclusive socio-economic benefits, especially for communities most dependent on biodiversity. It strengthens biodiversity-based livelihoods, safeguards customary sustainable use practices and traditional knowledge, and enhances incentives for community-led conservation. The target supports poverty reduction, food and nutrition security, gender equality, and inclusive local economic development. It aligns with Timor-Leste's national development priorities, decentralization framework, and commitments under the SDGs, particularly SDGs 1, 2, 5, 8, 10, 13, and 15. Key actions are:

Actions

- **9.1.** Expand sustainable wild species-based livelihoods (terrestrial, marine/coastal, and freshwater), including small-scale fisheries, sustainable harvest, agroforestry, aquaculture, ecotourism, and non-timber forest products (NTFPs) using Nature-based Solutions (NbS) approaches
- **9.2.** Establish and strengthen sustainable wild species-based value chains to promote ecotourism, small and medium-sized enterprises, women-led entrepreneurship, and the circular economy, thus contributing to local economy and livelihoods
- **9.3.** Establish transparent benefit-sharing systems for income and non-monetary benefits derived from wild species and other biological resources (e.g., fisheries, ecotourism, conservation agreements, PES), ensuring women, youth, and vulnerable groups have equal access to wild species-based livelihood opportunities, training, leadership, and benefit-sharing
- **9.4.** Formally recognize and support customary rules and traditional knowledge for sustainable wild species use and management, including community governance in LMMAs, community forests, and inland waters.
- **9.5.** Monitor and report the social and economic benefits from sustainable wild species use (land, marine, and freshwater) within national and municipal plans, budgets, and the NBSAP M&E system

Target 10. Sustainable management and use of resources across sectors

By 2030, ensure the sustainable management of forests, fisheries, agriculture, aquaculture, and wildlife in Timor-Leste by promoting ecosystem-based practices, strengthening enforcement, and supporting community-based livelihoods to safeguard biodiversity and ecosystem services.

The Constitution guarantees all citizens the right to a healthy, ecologically balanced environment and the duty to protect it for future generations. Timorese communities have deep cultural and livelihood connections to nature. Yet, unsustainable resource use, such as chronic soil erosion, deforestation, shifting cultivation, poorly planned agricultural expansion, and inappropriate infrastructure, has degraded ecosystems. Agriculture, aquaculture, fisheries, and forestry are critical production systems but can significantly impact biodiversity if not managed sustainably.

Growing demand for food, fibre, and fuel is driving further biodiversity loss, making sustainable management essential. When well implemented, it enhances ecosystem services such as soil fertility, erosion control, pollination, and natural pest regulation. Sustainable management in marine systems requires better fishing practices, reduced plastic waste, and stronger data on catch levels and species abundance. Expanding LMMAs and protecting coastal and marine resources are central to advancing the blue economy, a national priority.

On land, Timor-Leste has extensive areas of degraded and secondary forests, caused by decades of slash-and-burn farming and the clearing of steep slopes. Sustainable forest management is vital for communities that depend on forests for food, fuel, and income. Priority actions include reforestation, soil and watershed protection, agroforestry, fuelwood plantations, coastal restoration, and improving landscape connectivity. The Forest Department has long-term management plans but requires significant external support to implement them fully. Target 10 brings together the primary biodiversity-related managed resources under the theme of sustainable management and links closely with Targets 1 (spatial planning), 2 (reducing degradation), and 11 (ecosystem services). It contributes to SDGs 2, 3, 6, 14, and 15, aligns with all Global Forest Goals, and supports commitments under the Glasgow Leaders' Declaration on Forests and Land Use. Key actions under this target are grouped by sectors below.

Actions

Forestry sector

- **10.1.** Document and promote traditional knowledge, techniques, and practices for the conservation and sustainable use of biodiversity
- **10.2.** Promote agroforestry, high value tree planting, elephant grass, and bamboo plantations in at least 4 municipalities as a mechanism to improve livelihoods and promote sustainable management of the surrounding natural forest, in part through community forestry, and carbon market approach (Ongoing project through JICA; recent EU project completed)
- **10.3.** Develop forest management plans to enable sustainable forest management in all municipalities
- **10.4.** Increase enforcement to reduce illegal logging, including through training of officers
- **10.5.** Continue to develop and improve the Aileo Municipal Botanical Garden to protect tree species and as a tourist destination (Ongoing MALFF programme)
- **10.6.** Establish community-based nurseries especially for high-value timber trees, focusing on native tree species, and involve local communities in reforestation/planting activities, promoting women's leadership in nursery management and decision-making and equitable participation in benefit-sharing

Fisheries sector

- **10.7.** Finalize and implement the fisheries strategic action plan and National Ballast Water Management Strategy promote sustainable fishing including for the offshore fishery, and draft the Blue Economy Policy, revisiting the draft National Ocean Policy (Ongoing MALFF programme)
- **10.8.** Promote campaigns at fishing communities for fishing techniques that reduce risk of depleting fish production capacity, including by defining open and closed areas through increased LMMAs (Ongoing MALFF programme with WorldFish and Blue Ventures)
- **10.9.** Establish and implement Integrated Coastal Management (ICM) programmes focusing on sustainable livelihood development, including sustainable fishery management with support to the artisanal fishery sector

10.10. Enhance fishery production quality and improve distribution of sustainable fisheries production, including developing fisheries production quality standards

10.11. Support the creation of financial institutions to provide small and rotating loans for fishermen and fish-farming communities (Possible collaboration with FAO for this action.)

10.12. Transform Maubara National Institute of Fisheries and Aquaculture into an integrated center for Fisheries and Aquaculture Research development and capacity building, which includes an educational and a fishery monitoring component

10.13. Establish a National Centre for Cetacean Regulation, Research, and Control (cf. Target 4)

10.14. Improved maritime enforcement, including through the use of satellite technology

Aquaculture and fisheries sector

10.15. Improve the fish hatcheries by providing improved equipment ensuring sustainable production

10.16. Provide support to 2,565 freshwater aquaculture families, 2,820 marine aquaculture families and 172 salt farming aquaculture families for sustainable production and harvest

10.17. Train 100 aquaculture families with new technology applicable to the cultivation and sustainable harvest of freshwater, brackish, and marine fish

10.18. Establish aquaculture groups or associations to multiply certified and commercial fingerlings

10.19. Establish a fish feed production centre

Agriculture sector

10.20. Introduce and promote appropriate and biodiversity-friendly improved farming practices to increase production in agricultural lands, including alley cropping, crop rotation, terracing, reducing slash and burn practices, and using climate-ready high-yield seeds, ensuring at least 50% women beneficiaries, support to at least 30% young women in horticulture and fruiticulture, and promotion of women's leadership in agricultural decision-making (Ongoing MALFF Programme).

10.21. Improved livestock management and sustainable grazing to reduce the risk and impact of overgrazing from livestock

10.22. Continue to diversify types of products and develop alternatives to subsistence agriculture through the Seeds of Life Programme and research programmes at MALFF

10.23. Establish gene banks and community seed banks to ensure sustainable supply of seeds of native crop varieties (Ongoing MALFF Programme).

10.24. Provide subsidies to farmers who use sustainable techniques to improve crop production

10.25. Conduct research, development, and dissemination of seeds for specific crop varieties to improve crop yields on less land including through proper zonation of lands for crop types. (Ongoing MALFF Programme).

10.26. Map agro-ecological zones (ongoing) and promote agricultural landscapes approach, including the integration of biodiversity-friendly practices such as agroecology, agroforestry, riparian buffers, and ecological corridors within production systems,

enabling agricultural lands to function as connective pathways across wider landscapes.

Target 11. Restoring ecosystem services

By 2030, restore ecosystem services on 20% of degraded areas using ecosystem-based approaches such as watershed and coastal restoration, integrated water management, and payment for ecosystem services.

Nature provides a variety of ecosystem services that underpin people's well-being and quality of life. As biodiversity declines, nature's contributions to people decline as well, with profound implications for human well-being and social cohesion. The restoration, maintenance, and enhancement of ecosystem services is crucial for the conservation and sustainable use of biodiversity. A significant connection exists between biodiversity conservation, ecosystem services, and human health. Without access to food, medicine, and spiritual services, human health deteriorates. Recent examples include the link between several zoonoses and widespread deforestation, which has increased human-wildlife contact.

Much of Timor-Leste experiences an extensive dry season, which has been exacerbated in recent years by a warmer climate. Water scarcity is a significant issue in many parts of the country, necessitating careful management of this vital resource. A factor contributing to poor quality and quantity of water has been the deforestation of river valleys, leading to rapid runoff and high sediment loads and making water undrinkable. Sediment loading also contributes to mangrove forest deterioration in estuaries, which, in turn, makes coastal areas more susceptible to storm surges. Loss of forests also reduces many other services, including food, fuel, and medicines. This target is closely linked to Targets 1, 2, and 10. This target contributes to many of the SDGs, including numbers 1, 2, 3, 6, 11, 14, and 15, as well as GFG 2. Key actions are as follows.

Actions

- **11.1.** Develop educational materials for educating school children about the important relationship among biodiversity conservation, ecosystem services, and human health
- **11.2.** Develop and implement an Integrated Water Management Plan, involving key concerned sectors (agriculture, forestry, infrastructure, water, fisheries and aquaculture, and public heath) to address pollution and sedimentation
- **11.3.** Monitor pollution/water quality, sedimentation of rivers, soil erosion and implement restoration activities to prevent siltation (see Target 7)
- **11.4.** Develop water quality standards and establish a water quality laboratory, including recruitment and training of women as lab technicians and water monitoring specialists and adoption of gender-inclusive workplace policies
- **11.5.** Develop and implement a payment for ecosystem services (PES)scheme for water and forest resources

11.6. Continue recovery of degraded lands, especially along river valleys and coastal areas, including 15 watershed plans completed (see Target 2) (Ongoing MALFF Programme)

11.7. Promote and develop the commercial production of seaweed as an alternative livelihood

Target 12. Improving green and blue spaces in urban centres

Significantly increase the area, quality, and connectivity of, and benefits from, green and blue spaces in Dili, Baucau, and other municipalities, and ensure that biodiversity is considered in urban and other municipal planning by 2030.

Recreational areas within and near cities have a range of positive effects on human health, including improved physical and mental well-being, in both rural and urban landscapes. Ensuring the availability and accessibility of such places is essential because the increasing trend towards urbanization tends to separate people from nature, lowering their understanding of biodiversity and the ecosystem services it provides. Green and blue areas can also provide critical habitat for certain wild species and help mitigate extreme events, such as providing shade during heatwaves. This target focuses on creating space for nature within built landscapes to improve citizens' health and quality of life. Such spaces require spatial planning to mitigate the negative impacts on biodiversity caused by urban expansion, roads, and other infrastructure. The Government of Timor-Leste has recognized the importance of improving the lives of city residents by revitalizing the waterfront area in the capital city, Dili, and other cities. City planning needs to consider incorporating green and blue spaces into cities like Baucau and Dili through policy. This target contributes to SDGs 3, 11, and 16. Key actions include:

Actions

12.1. Improve and rehabilitate the waterfront and shoreline in Dili

12.2. Improve co-operation among the Environment Department, the Ministry of State Administration, and the Ministry of Public Works for the restoration and creation of gardens and green spaces in Dili, Bacuau, and other municipalities, with women's participation in municipal decision-making and employment in nursery, park, and garden maintenance programmes

12.3. Develop and expand green spaces for citizens, with recreational trails to improve biodiversity, greenery and human health

12.4. Implement 'Green List' of protected and conserved area pathway, with women's representation in site governance and assessment teams and integration of gender-responsive governance criteria

Target 13. Implementing Nagoya Protocol

By 2030, complete accession to and fully implement the Nagoya Protocol to promote benefit-sharing mechanisms for the use of genetic resources and traditional knowledge.

Sharing of benefits from the use of genetic resources was initially covered under Article 15 of the CBD. The adoption of the Nagoya Protocol on Access and Benefit Sharing (ABS) has created

greater legal certainty, clarity, and transparency for users, providers of genetic resources, and traditional knowledge holders. A UNEP project, in cooperation with the Department of Environment, has provided a comprehensive basis for acceding to and implementing the Protocol, including a set of policy options, operating guidelines, traditional knowledge guidelines, model clauses, and a code of ethics. The government has appointed both a "competent national authority" and a "national focal point", as required by the Nagoya Protocol. What remains is for the government to provide information to communities, and finally accede to the treaty. This target directly addresses SDGs 1, 5, 10, 14, and 15, as well as GFG 2. Key actions are as follows.

Actions

- **13.1.** Complete the accession process (Ongoing Dept. of Environment Programme)
- **13.2.** Conduct an awareness-raising programme for policymakers, government and non-government stakeholders, including private sectors and communities to understand the Nagoya Protocol and why its implementation is important to Timor-Leste (ABS)

Target 14. Integrating biodiversity across government policies, plans and processes

Government integrates biodiversity conservation into all sectoral management and development policies, plans, and processes, considers a national accounting for ecosystem services, and ensures that EIAs are conducted for all proposed developments by 2030

Mainstreaming biodiversity conservation concerns into all relevant sectors of government and business aims to ensure that biodiversity values are considered in decision-making and policymaking across governments, economic sectors, and society. The multiple values of biodiversity are not widely reflected in decision-making, mainly due to a lack of understanding of potential impacts and because government development departments often act independently, without cooperating with resource managers in other departments. Currently, there is little dialogue between the key Ministries and Departments and those responsible for development and infrastructure decisions, such as roads and dams. Decision-making and policy development that considers the conservation of biodiversity and the ecosystem services it provides requires improved cooperation among government agencies.

The current government has an impressive agenda, much of which, if implemented, will enhance conservation. To accomplish this agenda, however, requires the mainstreaming of biodiversity into policies at all levels of government. Issuance of environmental licenses is complicated, with the permitting role divided among the EIA Authority, Mining Authority, and Petroleum Authority. Regardless, all agencies must abide by Decree Law 39 (2022). All environmental standards relevant for maintaining biodiversity are international in the absence of any national standards. Further, there is no environmental testing laboratory in the country, and any testing must be sent abroad, with results taking up to several months. This target contributes to several of the SDGs, including 1, 2, 5, 10, 13, 14, and 15. Key actions planned under this target are as follows.

Actions

- **14.1.** Form a national-level government-wide environment committee with a mandate to consider cross-cutting issues related to development, including issues such as biodiversity, climate change, gender, tourism, capacity-building and education, and human health
- **14.2.** Continued implementation of the Environmental Licensing programme for any new developments, as a prerequisite for approval (National Decree No.5/Feb 2011), including training of women environmental officers in EIA review and gender balance in field inspection teams (Ongoing Programme)
- **14.3.** Improve the system for obtaining Environmental Licensing to make the process more transparent to the public, including with public consultation for major development projects and respecting the rights of local communities as part of a prior and informed consent.
- **14.4.** Improve coordination and communication with petroleum authorities and mining authorities to only provide environmental licenses to companies with environmental protection built into the permit, and after an EIA has been completed
- **14.5.** Review and, as relevant, update existing agricultural policies, plans and processes, to integrate biodiversity and its multiple values, including sustainable tourism

Target 15. Biodiversity fully considered by businesses

Establish a pilot programme with 5 businesses to report on their impacts on biodiversity and to develop mechanisms to mitigate these impacts, providing information to consumers on how to reduce waste by 2030. Such programmes could include working with the banking sector (e.g., Banco Nacional de Comercio de Timor-Leste), the oil and gas sector, the shipping sector, and coffee producers (e.g., Timor Global LDA, Café Timor). This target would benefit from the process outlined by the Science-Based Targets Network[22], as well as the BIOFIN documents.[23]

Several businesses depend on biodiversity, yet this dependency is rarely recognized. By assessing and monitoring their impacts on biodiversity, businesses can better understand their relationship with biodiversity and evaluate the effects and subsequent risks of biodiversity loss in their operations. An assessment of these relationships, impacts, and risks makes it easier to take concrete steps to address them. Governments have a crucial role to play in this process, as they can implement the necessary legal, administrative, or policy measures to consistently and equitably facilitate biodiversity-impact assessments. There are not many large international businesses operating in Timor-Leste; however, local companies dealing in oil and gas, waste management, consumer services, food distribution, and tourism could become partners under

[22] https://sciencebasedtargetsnetwork.org/take-action-now/take-action-as-a-company/what-you-can-do-now/
[23] See: www.biofin.org

this target. Target 15 can contribute to achieving SDGs 6, 9, 11, 14, 15, and 17, as well as GFG 5. Key actions are listed below.

Actions

- **15.1.** Select 5 businesses and negotiate terms of an agreement for reporting on risk to and possible impacts on biodiversity and the suitable indicators (first 3 years), leveraging from experiences of other businesses in advancing nature reporting, in collaboration of internationally recognized business-related networks.
- **15.2.** Work with the 5 pilot companies to develop mitigation planning to reduce impacts on biodiversity (final 4 years) , including women employees in CSR planning and participation of women in environmental auditing teams

Target 16. Improving sustainable consumption and waste management

By 2030, promote sustainable consumption and waste management through education and policy, legislative or regulatory framework for integrated waste management, recycling, and composting initiatives.

Unsustainable consumption is an underlying driver of biodiversity loss. Halting and reversing biodiversity loss requires shifting towards more sustainable consumption patterns that consume resources and produce waste within planetary boundaries. Minimizing losses and waste is also crucial for sustainable fisheries and responsible consumption. Governments have a central role in making information available and accessible to consumers, who, in turn, can make better, more informed consumption choices. This target is also linked to KMGBF Target 7, which aims to reduce pollution, in part through improved waste management. Reducing unsustainable consumption requires education at an early stage; therefore, priority areas for effort include developing a short curriculum for schools and teaching children about wise choices, waste reduction, and overconsumption. Integrated waste management is another area where waste can be reduced through composting and recycling. This target can contribute to the achievement of SDGs 1, 2, 3, 4, 14, and 15. Key actions are listed below.

Actions

- **16.1.** Continue to strengthen plastic management policies by improving plastic import rules
- **16.2.** Promote and practice integrated waste management and establish waste banks
- **16.3.** Develop and implement elementary and secondary school waste awareness programme and provide information brochures to libraries, involving female teachers and students and promoting girls' leadership in eco clubs
- **16.4.** Develop a public composting system through organic collections from restaurants and other businesses and promote the use of the compost in agricultural areas, including

women farmers and waste workers and ensuring equal access to compost-use benefits

Target 17. Implementing the Cartagena Protocol

Strengthen capacity for and implement biosafety measures as outlined in Article 8(g) of the CBD, as well as measures for the handling of biotechnology and distribution of its benefits, as set out in Article 19, aligning with the Cartagena Protocol.

This target concerns the implementation of the Cartagena Protocol on biosafety. Biosafety measures are designed to ensure that genetically modified organisms (GMOs) resulting from biotechnology are handled and used with appropriate safety precautions, given their potential risks. Timor-Leste is not a party to the Cartegena Protocol and could be a supplier of new genetic resources once the Nagoya Protocol is implemented. Greater research effort on genetic resources could help the country address its own needs, especially in agriculture and forestry. As a net importer of food, plants, and livestock, the government must enforce stringent quarantine measures to protect itself from the potential introduction of harmful modified organisms. This target relates to SDGs 14 and 15. Key actions of this target are as follows.

Actions

- **17.1.** Increase the capacity of ministry staff relevant to safe food identification of foods contain genetic modifications and additive materials that are regulated by health standards
- **17.2.** Strengthen facilities and train human resources for biosecurity
- **17.3.** Increase staff capacity for the identification and quarantine of new animals and crops
- **17.4.** Strengthen facilities in quarantine services to implement the Protocol, standards, and database for sanitary and phytosanitary controls to facilitate the import and export of agricultural products, while ensuring the interoperability of a Single Window system

Target 18. Reforming negative incentives and promoting positive incentives

Identify by 2027 and progressively phase out or reform incentives harmful to biodiversity, starting with the most harmful incentives, and seek out possibilities to implement positive incentives for the conservation and sustainable use of biodiversity.

Many well-intended incentives often have unintended consequences on biodiversity. They can drive biodiversity loss, often through overexploitation and unsustainable application of inputs. Eliminating, phasing out, or reforming harmful incentives is an essential component of biodiversity conservation and sustainable use of resources. The use of positive incentives for the conservation and sustainable use of biodiversity, on the other hand, provides financial resources or other motivations to encourage businesses to undertake actions that benefit biodiversity. Article 11 of the CBD calls on Parties to adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of biodiversity. There was uncertainty among the agencies that met in Baucau in November of 2023 about what incentives may be harming biodiversity in the country. Hence, one priority is to determine if any

such subsidies exist in the country. This target is related to SDGs 14, 15, and 17, as well as GFG 5. Key actions include:

Actions

- **18.1.** Establish a mechanism for all relevant ministries to indicate and report subsidy programmes to the Environment Department for the relevant National Reports to the CBD and to assess impacts of these subsidies on target and non-target biodiversity, ensuring gender balance in scientific and inspection teams
- **18.2.** Conduct research to determine non-target impacts on biodiversity to facilitate implementation of subsidy programmes, ensuring women officers receive equal technical training and safe, inclusive working conditions
- **18.3.** Develop mechanisms and integrate into policies to mitigate subsidies and incentives found to have unexpected or negative consequences on biodiversity
- **18.4.** Integrate mechanisms and plans to promote positive incentives to reduce the use of natural resources and enhance their sustainable management.

Target 19. Sustainable financing

Continue to work with multiple funding partners and development agencies, including NGOs and the private sector, to increase funding to conserve and manage biodiversity, and for the government to increase relevant agency budgets by at least 15% through building recognition for the importance of conserving biodiversity by 2030.

The KMGBF will be implemented primarily through activities at the national and subnational levels, with supporting actions at the regional and global levels. Together with other means of implementation, mobilizing adequate financial resources is critical to achieving the Framework's goals and targets. Developing countries will require substantial support to implement this framework and its targets. Timor-Leste has a limited tax base from which to fund biodiversity conservation, among many other government priorities aimed at assisting its human population. While the government's priorities include the preservation of natural resources, the country will be able to implement the activities proposed in this NBSAP only with the financial support and expertise of donors and development partners, backed by NGOs and innovative funding mechanisms, such as a tourism tax. This target is linked to SDG17 and GFGs 4 and 6. Major actions suitable for this target are listed below.

Actions

- **19.1.** Continue taking appropriate initiatives to attract investments from funding partners including GEF, GCF, etc., and regional funds, and encourage private sector investments specifically for biodiversity (Ongoing)
- **19.2.** Establish biodiversity fund to promote protection and needed information (data) on biodiversity and establish cross-ministerial coordination platform, confirming women's participation in fund governance and use of gender-responsive funding criteria

19.3. Continue to work diligently with existing UN agencies and funding partner country partnerships to conserve biodiversity, while carefully assessing donor self-interest vs. what is required in Timor-Leste (Ongoing)

19.4. Promote the carbon market, through article 6 (6.2 & 6.4) of Paris Agreement or via voluntary carbon market to facilitate community groups to engage in planting trees, securing women's equal access to carbon payments and benefit sharing

19.5. Develop and facilitate community-based fund-raising options (e.g. eco-tourism and introducing tourist tax to fund conservation programmes) to make communities self-sustained in financing biodiversity conservation efforts, ensuring women's participation in fund management and gender-responsive benefit-sharing mechanisms

19.6. Ensure agencies (NGOs, UN agencies and government institutions) implement programmes that enable data collection, collect and use local knowledge with respect, and that innovations are accessible to the communities (Ongoing)

19.7. Develop a Biodiversity Finance Plan by 2026 (Already initiated with technical support of UNDP and financing from GEF)

Target 20. Developing capacity through improved synergy and partnership

Continue to facilitate and encourage South-South, North-South, and triangular cooperation to increase capacity and technological skills development of government and university staff, while increasing the understanding of Timor-Leste's biodiversity and ecosystem functioning.

Parties require the necessary expertise and tools with which to implement the KMGBF and its targets. Capacity development, technical and scientific cooperation, technology transfer, and innovation are crucial for enhancing the abilities and effectiveness of individuals, agencies, and systems at various levels, thereby improving biodiversity-related decision-making, implementing this plan, monitoring, and ultimately achieving the desired outcomes. To determine capacity-building needs, the country should bring together various stakeholders to identify solutions, propose concrete actions, and establish mechanisms to address the priority capacity needs and gaps. This relates to the action under Target 14, which calls for the establishment of a national environmental committee. This target supports SDGs 3, 14, 15, and 17, as well as GFG 6. Key actions for this target are as follows.

Actions

20.1. Assess the needs for capacity building, and to recommend solutions, propose actions, and identify mechanisms to address the identified capacity needs, and gaps in collaboration of the national environmental committee (if established - see Target 13) and other stakeholders

20.2. Develop joint programmes with relevant sectors for funding from development partners (DFAT, JICA, KOICA, AFoCO, etc.) and multilateral (GEF, GCF) adaptation funds, etc. (Ongoing)

20.3. Create an inter-ministerial commission and various technical working groups to produce and share information to ensure gender parity in commission membership and inclusion of women experts in data governance discussions

20.4. Establish links or partnerships with regional organisations and interested universities in the Asia region, and improve existing partnerships (e.g., by inviting SPREP to assist in specific marine monitoring programmes) ensuring gender balance and inclusion of women scientists as lead authors or project coordinators (Ongoing)

20.5. Ensure that projects from development banks include a strong component to sustainably use and protect biodiversity (Ongoing)

Target 21. Strengthen biodiversity monitoring through research, databases, and local knowledge integration

By 2030, establish and operationalize a national biodiversity monitoring and database system that integrates scientific research, community-based monitoring, and traditional knowledge to provide baselines, track trends, and inform evidence-based conservation decisions.

All countries need data and knowledge to identify threats, to determine needs and priorities for biodiversity conservation, to plan, and then take evidence-based decisions and actions. This work includes establishing baselines and objectives and then monitoring and reporting on progress for the conservation and sustainable use of biodiversity. Global datasets such as Global Forest Watch, NOAA climate data, and the IUCN Red List can contribute. Still, the only way to determine successful outcomes at the national level is to develop a national monitoring program.

A limiting factor for the sustainable management of lands and resources in Timor-Leste is the lack of data and data trends to assess changes. For example, the last land cover survey was conducted in 2013; there are insufficient wildlife harvest data, and very few data exist on fish catch, including both quantities and species. Some work has been initiated for fisheries, but the data are from a limited number of sampled villages and may not be representative of the national fish harvest. The country needs to develop a national biodiversity database that includes a baseline for specific sustainability indicators.

Such an effort can be coordinated through a biodiversity committee or the suggested national environmental committee. Considerable success has been achieved in monitoring elsewhere through community monitoring programs, where community members are trained in specific data-collection methods, often using cell phone technology. Examples include data collections in many countries through LMMAs and CFs, where interested individuals take on the responsibility of data collection.

WorldFish has achieved some success in Timor-Leste by using community sampling, which compensates participants for their time and data, although such payments are typically unnecessary. Many types of data may only need to be collected every five years or more, such as forest growth, while others, including fish harvest, require annual assessments. Once the indicators have been identified, it is necessary to establish a baseline. This target is linked to SDGs 14 and 15, as well as GFGs 1, 2, and 5.

CBD urges the establishment of a Clearing House Mechanism (CHM) to promote and facilitate technical and scientific cooperation among the Parties. This platform was designed following the first NBSAP in parallel with the 4th National Report. Relevant stakeholders engaged in NBSAP development and implementation were trained to input data and update information on this platform, including two designated Staff trained in Manila, Losbanos at the ASEAN Centre for Biodiversity, to ensure the sustainability of the CHM. However, the CHM Platform is not fully operational due to a lack of internet connectivity and the responsibility for its maintenance. Key actions are as follows.

Actions

- **21.1.** Formulate an interdepartmental environment committee (see Target 13, Action 1) to oversee and support national biodiversity database management (National Biodiversity Information Facility) that uses standardised monitoring protocols and data format
- **21.2.** Strengthen and develop human resources, including local people to strengthen citizen science, for biodiversity monitoring through workshops and training abroad, as well as through technology transfer from funding partner projects making sure gender parity among participants and access to mentorship for women in biodiversity monitoring
- **21.3.** Conduct a comparative study of data collection methods and indicators in other small island developing states to develop tailor-made strategy for Timor-Leste
- **21.4.** Develop clear NBSAP monitoring obligations and enforce this across the departments
- **21.5.** Acquire and employ traditional knowledge from local communities, at pilot sites, using both oral history and developing community-based sampling for biodiversity and habitats
- **21.6.** Ensure that all projects have a built-in monitoring component that uses indices listed in this NBSAP
- **21.7.** Launch a National Biodiversity Baseline and Monitoring Programme and continue to strengthen it through appropriate data and integrate this into nutrition-sensitive policies and community management of inland waters
- **21.8.** Collate data and feed into a biodiversity database and portals using rapid biodiversity assessments and link this with the Clearing House Mechanism (CHM) with inclusion of women in data entry, management, and analysis roles
- **21.9.** Conduct characterization, assessment and monitoring of biodiversity, including freshwater biodiversity, for food and agriculture by engaging women and marginalized communities and private sector actors, integrating traditional knowledge of women and marginalized groups and ensuring equitable access to capacity-building and benefits

Target 22. Inclusive participation of all stakeholders, especially women

Ensure that women, youth, people with disabilities (PwD), and other marginalized groups are represented and have equal participation in decision-making related to biodiversity and land management, and that they have equal rights and access to land and natural resources.

Local communities in Timor-Leste hold deep cultural and traditional knowledge of nature, including practices such as *tara bandu*, which play an essential role in community-based conservation. Integrating this knowledge into biodiversity planning strengthens the cultural relevance, acceptance, and effectiveness of conservation measures. The target also highlights inclusive participation, ensuring women, youth, PwD, and other marginalized groups are fully engaged in biodiversity governance. Their involvement promotes equity and empowers them to contribute to sustainable resource management. Protecting environmental human rights defenders is essential, as they safeguard biodiversity, report violations, and advocate for rights-based approaches.

Gender dynamics strongly influence natural resource management. Although women play key roles in agriculture, forestry, and fisheries, limited access to land, education, healthcare, and finance restricts their participation. Addressing these barriers and integrating gender perspectives into decision-making enhances both equity and conservation outcomes. In line with the KMGBF Gender Plan of Action, this target also promotes the full, equal, and meaningful participation and leadership of women and girls, the application of gender-responsive safeguards, and the use of sex-disaggregated data and indicators to inform policy and monitoring.

This target supports SDGs 5, 10, 14, and 15, aligns with the Global Biodiversity Framework, and complements commitments under the UNFCCC, including efforts to halt deforestation by 2030 (FCCC/PA/CMA/2023/L.17). It also reinforces the Paris Agreement, national NDC priorities, and Timor-Leste's progress toward the Nagoya Protocol and implementation of Cartagena Protocol biosafety measures. Collectively, it reflects the country's commitment to inclusive, equitable, and rights-based biodiversity conservation. Key actions under this target are as follows.

Actions

- **22.1.** Ensure that all government's projects (ongoing and future) related to biodiversity conservation enable input from all members of involved communities, with a special emphasis on safeguarding participation by women, people with disabilities, other minorities and youth (Ongoing)
- **22.2.** Ensure that the interdepartmental environmental committee is gender, youth and other minority balanced, to the extent possible
- **22.3.** Invite environmental defenders to share their concerns and feedback on any development project and policy and strategy development efforts (Ongoing)
- **22.4.** Ensure all new projects will have a component ensuring attention to gender and minority issues (Ongoing)
- **22.5.** Strengthen the legal recognition of tenure rights for local communities with customary tenure systems

The Timor-Leste government organized a meeting in Maubisse and made some commitments in gender (**Section 8.1.2 of this document**). The commitments need to be duly considered while implementing the NBSAP. The Maubisse Commitments set clear, measurable gender-related targets relevant to NBSAP implementation. For the National Directorate of Environment (NDE), commitments include ensuring 30% of rural women have access to renewable and clean energy; supporting 2,000 families, including women-headed households, to adopt alternative energy solutions under Fugaun Foun Timor; enhancing women's knowledge on climate change, disasters, and environmental degradation; ensuring 50% of rural women participate in environmental management and environmental impact assessments; promoting 30% rural women's employment in Protected Areas and National Parks; and strengthening institutional capacity to collect sex-disaggregated environmental data.

For MALFF, commitments include implementing the National Gender Equality Policy at national and municipal levels; ensuring 40% of agricultural programme beneficiaries are women; supporting 30% young women in horticulture and fruiticulture; promoting 30% women extensionists at the municipal level; strengthening MALFF capacity for sex-disaggregated data collection; promoting women's leadership in agricultural decision-making; and fostering sustainable agriculture, fisheries, and food security for women.

6.4 Institutional Roles and Responsibilities

The successful implementation of the updated NBSAP will require close coordination among the key ministries and directorates of the government concerned with various aspects of biodiversity conservation and management, as well as funding partnres, and development agencies, universities, NGOs, and the private sector (**Table 8**). In addition, under the KMGBF and the SDGs, the UN is calling for government-wide consideration of biodiversity across all policies and actions, including national planning, road building and other infrastructure development, mining, tourism, and electricity generation. The majority of targets have an implied essential need to manage and conserve forests and so relate directly to the UNFF Global Forest Goals (GFGs). Various UN agencies mandated to promote food security and sustainable agriculture, aquaculture, fisheries, and forestry could assist Timor-Leste in implementing and monitoring relevant national actions and targets.

Table 8. Key government ministries responsible for implementing different NBSAP targets

Target	MALFF	MTE	MTI	MSA	MPW	MF	ME	MH	MPSI	MJ	MSSI
1	√	√							√	√	
2	√										
3	√	√									
4	√										
5	√										
6	√	√	√								
7	√	√		√	√						
8	√	√									

9	√										
10	√										
11	√	√									
12				√	√						
13	√									√	
14	√	√	√	√	√		√	√			
15		√	√								
16	√	√					√	√			
17	√	√	√							√	
18	√	√	√								
19	√	√				√			√		
20	√	√							√		
21	√	√							√		
22	√	√								√	

Note - MALFF: Ministry of Agriculture, Livestock, Forestry, and Fisheries; MSA: Ministry of State Administration; MPW: Ministry of Public Works; MTE: Ministry of Tourism and Environment; MTI: Ministry of Trade and Industry; ME: Ministry of Education; MH: Ministry of Health; MF: Ministry of Finance; MPSI: Ministry of Planning and Strategic Investments; MJ: the Ministry of Justice; MSSI: Ministry of Social Solidarity and Inclusion

The table above illustrates the alignment of KMGBF Targets with the mandates and responsibilities of key government ministries and agencies in Timor-Leste. It highlights which institutions have direct or supporting roles in achieving specific targets under the updated NBSAP. Overall, the table demonstrates that effective NBSAP implementation will require strong inter-ministerial coordination, joint monitoring, and integration of biodiversity considerations across sectors.

MTE will serve as the lead coordinating authority for NBSAP implementation. It will be responsible for providing strategic leadership and policy direction on biodiversity conservation and ecosystem management, and for ensuring that environmental and social safeguards are systematically applied across all NBSAP actions. It will oversee the integration of environmental screening, impact assessment, and restoration guidelines into biodiversity programmes; lead national-level monitoring, reporting, and compliance, including environmental licensing under Decree-Law No. 5/2011; and ensure coherence with Timor-Leste's obligations under international agreements such as the CBD, UNFCCC, and UNCCD, as well as with development partners safeguard standards (e.g. UNDP and GEF requirements).

MALFF will play a central role in managing biodiversity outcomes within agriculture, forestry, fisheries, and food systems. Its responsibilities also include mainstreaming biodiversity conservation and ecosystem restoration into production landscapes and seascapes; promoting sustainable agriculture, agroforestry, and fisheries practices to reduce deforestation, land degradation, over-extraction, and pollution; supporting participatory land-use planning and clarification of tenure and resource-use rights; and monitoring ecosystem health in areas under

agricultural and fisheries management, including the application of mitigation and restoration measures where development pressures exist.

MSSI and the Secretary of State for Equality will be responsible for ensuring that social safeguards and GEDSI principles are fully embedded in NBSAP implementation. It will also be accountable for promoting equitable participation of women, youth, local people, and other vulnerable groups in decision-making, capacity-building, and benefit-sharing mechanisms; supporting the development and monitoring of gender-responsive and socially inclusive indicators; leading community outreach on rights-based biodiversity governance and livelihood diversification; and overseeing the operation of the Grievance Redress Mechanism (GRM) to ensure transparent, accessible, and conflict-sensitive resolution of complaints.

At the implementation level, the National Environment Directorate and Municipal Governments will be responsible for operationalizing the NBSAP at the sub-national level. Their roles include conducting local ecological monitoring to detect risks such as pollution, habitat loss, and illegal resource use; facilitating community participation and FPIC in biodiversity-related planning; delivering awareness and training programmes on restoration, waste management, and sustainable resource use; and supporting the documentation, protection, and application of Indigenous knowledge and cultural practices in biodiversity management. Several sectoral ministries play essential supporting roles. MPSI is responsible for biodiversity-inclusive spatial planning. ME contributes through environmental education and integration of biodiversity values into formal curricula, while MH supports recognition of biodiversity's role in public health, nutrition, and well-being. MSA and MPW will be primarily responsible for urban greening, and infrastructure-related biodiversity targets, Ministry of Finance is primary responsible for external resource mobilisation.

Meanwhile, the ME and MH will contribute to awareness raising, environmental education, and health-related ecosystem benefits. Target 13 is notably cross-cutting, requiring collaboration among all eight ministries, regarding access and benefit-sharing (ABS), traditional knowledge, and equitable participation in biodiversity management. For a regular collective decision making, coordination and periodic progress review, a national level Interministerial environmental committee will be formed, which will be chaired by MTE. CF committee, PA committee, tourism committee and other issue-based committees will be formed at the community level.

6.5 Spatial Priorities and Landscape-level Interventions

The updated NBSAP of Timor-Leste identifies a wide range of biodiversity-related activities across agriculture, forestry, fisheries, aquaculture, tourism, and protected area management. To support effective implementation, these actions now need to be translated into a spatially

explicit plan, including maps and prioritization tables that clearly indicate *where* different activities should occur and *which locations* are most relevant to specific NBSAP targets.

Spatial planning is more essential in Timor-Leste due to the country's diverse ecosystems, ranging from agricultural lowlands, montane forests, and river valleys to coral reefs, coastal wetlands, and offshore fisheries zones. Timor-Leste has also important inland wetlands hosting Small Endemic Fish Species in Aileu, Bobonaro, Viqueque, and Covalima. Each ecosystem provides distinct opportunities and constraints for biodiversity conservation, climate resilience, livelihoods, and sustainable development. By mapping priority zones, the NBSAP implementation process can improve coordination across sectors, reduce land-use conflicts, and guide government, municipal authorities, communities, and development partners toward evidence-based decision-making.

A review of the National Spatial Plan of Timor-Leste (both national- and municipal-level spatial planning documents) was conducted to identify priority biodiversity-related actions for each municipality. Key sources included the National Spatial Planning Policy, Municipal Spatial Plans, ecological structure maps, agricultural and forestry suitability zones, fisheries and aquaculture potential areas, tourism aptitude zones, and proposed protected area boundaries. These documents were examined to understand how land and seascapes are currently zoned, where natural resources are concentrated, and which areas face environmental pressure or development opportunities. In addition, local community perspectives were gathered during regional workshops and views of government officials were also documented during bilateral meetings. These interactions provided useful insights about the priorities and scope in different locations and also for spatial planning. In addition, various government documents were reviewed to identify priority regions for different types of conservation activities in different sectors.

Spatial information on forests, watersheds, coastal ecosystems, agricultural lands, grazing areas, fishing grounds, and tourism sites was synthesized and cross-referenced with NBSAP targets. This enabled matching sectoral priorities, such as sustainable agriculture, forest restoration, ecotourism, coastal resource management, and protected area strengthening, with the geographic regions most suitable for implementation.

The information was then organized municipality by municipality, highlighting where specific actions should be prioritized based on ecological suitability, existing land use, and local development plans (**Tables 9-13**). These are also depicted in figures in **Annexes 4**. This approach ensures that the NBSAP is spatially grounded, aligns with national planning frameworks, and provides practical guidance for implementing biodiversity actions across agriculture, forestry, tourism, fisheries and aquaculture, and protected areas. Summary of relevant actions for different municipalities, prepared based on bilateral meetings with government officials, consultation workshops, and local experts' own judgment, is presented in **Annex 5**. In addition, names of municipalities are spelled out in the actions wherever they are appropriate.

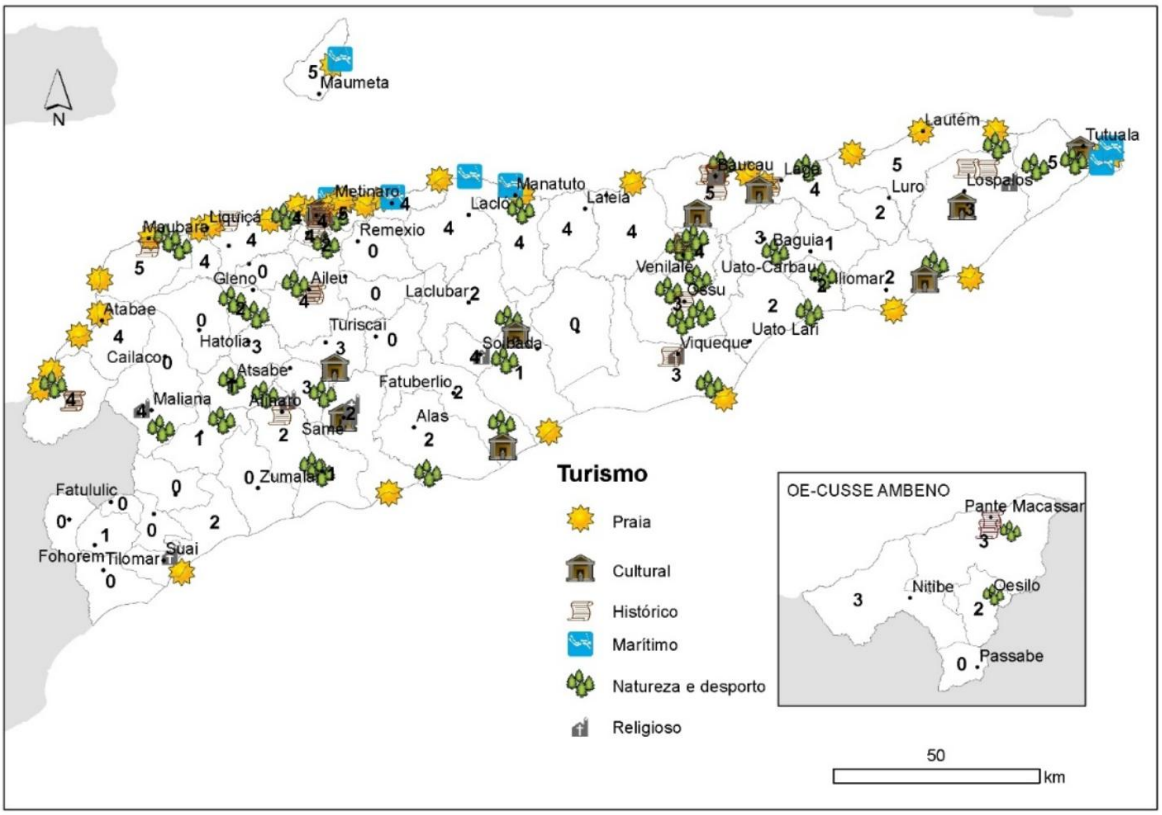


Figure 15. Tourism potential in different municipalities, along with the type of tourism activities appropriate at different geographic locations

Figure 15 illustrates the spatial distribution of tourism potential across Timor-Leste's municipalities, highlighting both the geographic spread and the diversity of tourism types suitable for different locations. Beach-based tourism is particularly prominent along the northern coastline, including Liquiça, Dili, Manatuto, Baucau, and Lautém, reflecting the presence of accessible beaches, coral reefs, and marine ecosystems suitable for coastal and maritime tourism. However, the map also shows that beach tourism opportunities exist around much of the country's coastline, including parts of the south coast and Oe-Cusse Ambeno, indicating nationwide potential for coastal tourism development if supported by appropriate infrastructure and environmental management.

Inland areas and upland municipalities demonstrate strong potential for nature-based and adventure tourism, including hiking, forest-based recreation, and eco-tourism linked to mountainous landscapes, protected areas, and biodiversity-rich ecosystems. Cultural and historical tourism sites are widely distributed across the country, reflecting Timor-Leste's rich cultural heritage, sacred sites, traditional villages, and historical landmarks associated with resistance history and colonial periods. Religious tourism sites are also present in multiple municipalities, often overlapping with cultural and historical attractions. Overall, the map underscores that Timor-Leste's tourism potential is highly diverse and geographically widespread, offering opportunities to develop integrated, place-based tourism strategies that combine beach, cultural, historical, nature, and community-based tourism while aligning with

biodiversity conservation and sustainable land- and seascape management. Coffee is an important economic source for Timor-Leste. Therefore, it is important to identify coffee-growing areas, so the government can prioritize its coffee conservation and promotion activities in the hotspot regions. **Figure 16** shows major coffee-growing areas in Timor-Leste.

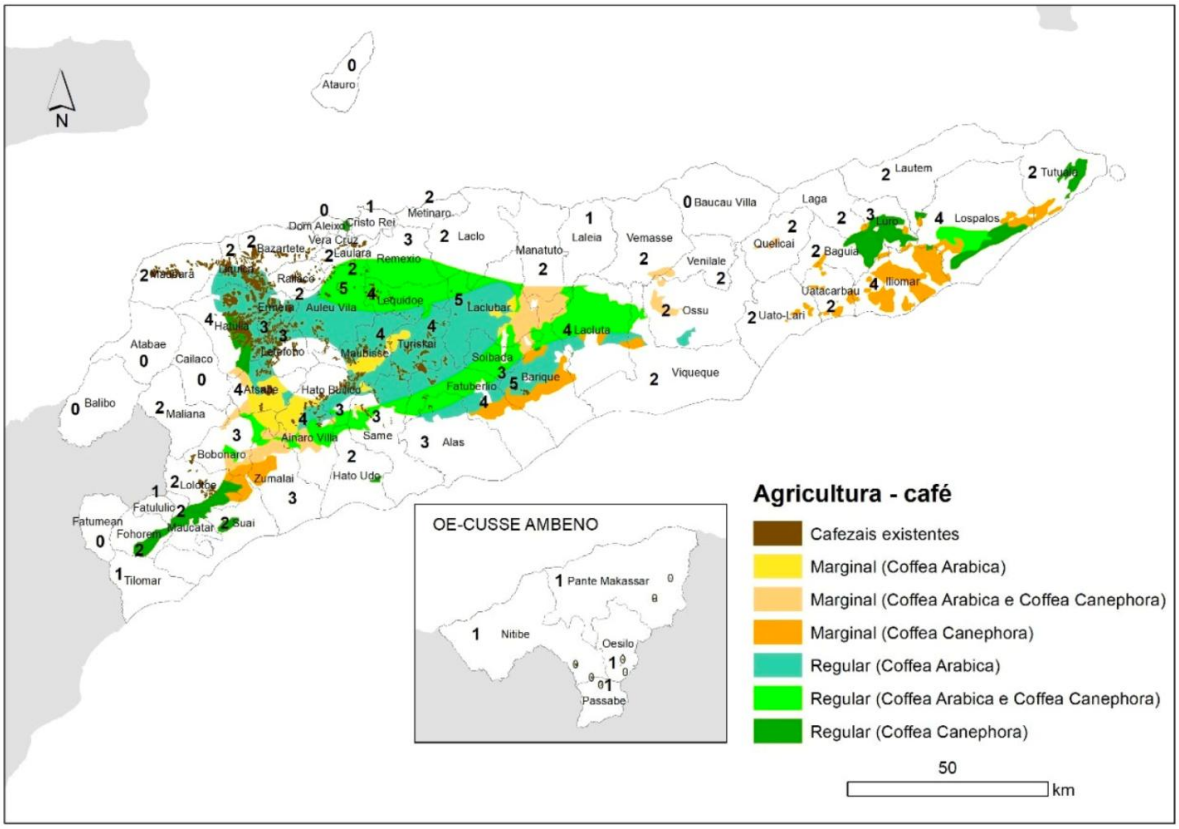


Figure 16. Coffee-growing area in Timor-Leste indicating where different varieties of coffee conservation and promotion programmes need to be prioritized

Table 9. Biodiversity-related activities in the agriculture sector identified in the National Spatial Plan (NSP) and their correspondence to NBSAP actions

Municipality	Biodiversity-Related Activities mentioned in the NSP	Specific Sites / Zones	Alignment with NBSAP Targets
Lautém	Cultivation of niche spices (vanilla, nutmeg, cloves, pepper, candlenut)	Municipality-wide	9.20 (biodiversity-friendly farming), 9.22 (product diversification)
	Development and rehabilitation of irrigation perimeters to support sustainable agriculture (≈695 ha of irrigated land)	Multiple sites (≈695 ha)	2 (restore degraded areas), 2.5 (restore soil), 8.1 (climate adaptation in agriculture), 10.2 (integrated water management)
	Promote value-addition and processing of agricultural/livestock products (to reduce rural pressure and sustain livelihoods)	Municipality-wide	9 (sustainable production systems), 18.5 (community-based finance, value addition)
	Safeguard water resources for agriculture and food security	Municipality-wide	8.1 (climate vulnerability/adaptation), 10.2 (integrated water management)
Baucau	Diversified family farming and livestock presence (mixed cropping + livestock integration)	Municipality-wide	9 (sustainable agriculture), 9.20 (improved practices), 9.21 (sustainable grazing)
	Expand and improve irrigation systems for climate-resilient crops	Seiçal, Laga, Vemasse floodplains	2 (restoration), 2.5 (soil function), 8.1 (adaptation), 10.2
	Protect and enhance Agricultural Zones to Strengthen (A1 zones)	Vemasse, Seiçal, Laga floodplains	1, 1.2, 2.5, 9.20
	Develop Agricultural Aptitude Zones (A2) with biodiversity-friendly practices (agriculture + aquaculture integration)	Larisula, Baguia, Gariuai–Buibau–Uailili	1, 9.20, 9.22, 9.23
	Promote sustainable agriculture and livestock in Legumau buffer zone (TU6)	Southern Baucau	2, 3.8, 8.4, 9.20
Viqueque	Development of irrigation systems for agricultural productivity	Municipality-wide	2, 2.5, 8.1, 10.2
	Soil conservation & erosion control in farming areas (slopes & degraded farmlands)	Lacluta, Ossu, Uato-Lari, Uato-Carbau, Viqueque	2.5, 8.2, 9.20
Bobonaro	Sustainable agriculture in Maliana floodplain (avoid degradation & sprawl)	Maliana floodplain	1, 1.2, 2.5, 9.20
	Agricultural cooperatives and capacity building to improve resource management	Cailaco, Balibó, Atabae, Lolotoe	9, 18.5, 21.1
Ermera	Sustainable coffee farming and soil conservation on slopes	Atsabe, Letefoho, Hatulia, Railaco	2.5, 8.1, 9.20
	Diversified cropping to reduce pressure on forests	Railaco, Fatubessi	2, 9.20, 13.5
Aileu	Establish agricultural cooperative centres to support sustainable land use & production	Municipality-wide	9, 18.5, 21.1
	Coffee and diversified crops (mixed farming systems)	Municipality-wide	9.20, 9.22
Ainaro	Coffee and diversified crops (shade-grown & upland systems)	Municipality-wide	9.20, 9.22
Manufahi	Diversified family farming; co-op centres for value chains	Municipality-wide	9.20, 9.22, 18.5
Liquiçá	Family-based diversified cropping (mixed cropping systems)	Municipality-wide	9.20, 9.22
Covalima	Extensive agricultural crops (zoning for crop expansion)	Suai area	9.20, 9.25
Oecusse-Ambeno	Crop diversification and livestock (family agriculture + grazing management)	Entire RAEOA	9.20, 9.22, 9.21

Table 10. Biodiversity-related activities in the forestry sector identified in the National Spatial Plan and their correspondence to NBSAP actions

Municipality	Biodiversity-Related Activities mentioned in the NSP	Specific Sites / Zones	Alignment with Relevant Targets
Lautém	Forestry development and restoration due to suitable natural conditions	Municipality-wide	2 (restoration), 2.2 (tree planting), 8.2 (reforestation & climate), 9.3 (forest mgmt plans)
	Reforestation and preservation of eroded/deforested areas using native species (incl. sandalwood)	Entire municipality	2.2 (reforest degraded areas), 8.2 (climate adaptation via trees), 9.2 (agroforestry / high-value trees), 9.6 (community nurseries)
	Protection of forest resources to prevent erosion and safeguard water sources	Municipality-wide	2 (ecosystem integrity), 8.2 (adaptation), 9.3 (forest management), 10.6 (recovery of degraded lands)
Baucau	Conditions favorable for forestry development (large areas suitable for reforestation)	Municipality-wide	2 (forest restoration), 9.2 (agroforestry/high-value trees), 9.3 (forest mgmt plans)
	Reforestation & preservation of degraded areas (forest regeneration in multiple sucos)	Gariuai, Uailili, Triloca, Bahu, Bado Ho'o, Quelicai, Uaimori	2.2 (tree planting), 8.2 (reforest rivers/slopes), 9.2 (community forestry)
	Restoration of mangroves & coastal forests (blue carbon & coastal protection)	Laga Administrative Post	2.1 (map degraded coastal/marine areas), 2.3 (recover mangroves), 8.4 (blue carbon/blue NbS), 9.9 (integrated coastal management)
	Control agro-forestry-pastoral exploitation on Baucau Plateau	Baucau Plateau	2 (limit degradation), 9.21 (sustainable grazing), 13.5 (integrate biodiversity in agri policy)
Viqueque	Reforestation of eroded areas with native species	Municipality-wide	2.2 (tree planting), 8.2 (reforest degraded lands), 9.2 (high-value trees)
	Preservation of existing woodland and control grazing	Municipality-wide	2 (maintain ecosystem integrity), 9.3 (forest mgmt), 9.21 (sustainable grazing)
Bobonaro	Conserve forested slopes of Loelako & Tapo/Saburai	South of Maliana	2.2 (reforestation), 8.2 (slope protection), 9.3 (forest mgmt), 10.6 (degraded land recovery)
	Agroforestry & coffee in upland forest around Lakus/Sabi	Lolotoe	9.2 (agroforestry), 9.20 (improved farming), 8.4 (ecosystem-based landscape connectivity)
Ermera	Reforestation and restoration in erosion-prone mountains	Atsabe, Hatulia, Letefoho	2.2 (tree planting), 8.2 (reforest slopes), 9.3 (forest mgmt)
	Protect forest areas inside settlement growth zones	Hatulia, Railaco	1 (spatial planning constraints), 3 (OECM/green spaces), 9.3 (forest mgmt)
Aileu	Forestry suitability & possible development (mixed forest–agroforestry potential)	Municipality-wide	2 (forest restoration), 9.3 (forest mgmt), 9.2 (mixed agroforestry)
Ainaro	Strong suitability for forestry (highland forests)	Highlands	2 (restoration), 9.3 (forest mgmt), 8.2 (reforest slopes)
Manufahi	Forestry expansion and hardwood potential (native & high-value timber species)	Municipality-wide	9.2 (high-value trees), 9.3 (forest mgmt)
Liquiçá	Forestry development potential (natural regeneration & slope restoration)	Municipality-wide	2 (restoration), 9.3 (forest mgmt)
RAEOA	Suitable for forestry development (reforestation & community forestry)	RAEOA	2 (restoration), 9.3 (forest mgmt)

Table 11. Biodiversity-related activities in the fisheries & aquaculture sector identified in the National Spatial Plan and their correspondence to NBSAP actions

Municipality	Biodiversity-Related Activities mentioned in the NSP	Specific Sites / Administrative Posts / Zones	Alignment with Relevant Target(s)
Lautém	Support sustainable fisheries based on high fish biomass	Tutuala offshore	5 (harvested wildlife management), 5.1 (data on harvested species), 9.7 (fisheries action plan), 9.9 (integrated coastal mgt)
	Modernisation and rehabilitation of Com Port, including fishing infrastructure	Com	5.1 (monitor harvest), 9.9 (ICM & livelihoods), 9.10 (fish product quality/standards)
Baucau	Coastal small-scale fisheries potential	Vemasse, Laga, Baucau coast	5 (wildlife harvest mgmt), 9.7 (fisheries action plan), 9.8 (responsible fishing campaigns)
	Develop Special Business Zone with fisheries centre	Seiçal–Laga	5.1 (data on harvest), 9.10 (fish quality/standards), 9.11 (finance for fishers)
	Promote fishing and aquaculture including small ponds and integrated systems	Vemasse/Karavela, Baucau/Uatabu, Laga, Venilale, Baguia, Quelicai	5 (harvested species mgmt), 9.15–9.19 (aquaculture development), 9.20 (integrated farming systems)
Viqueque	Sustainable management of river & coastal ecosystems	Irabere, coastal Uato-Carbau, Lacluta	5 (harvest mgmt), 9.7 (fisheries plan), 9.9 (ICM), 10 (ecosystem services)
	Restoration of degraded aquatic habitats and river corridors	Municipality-wide	2 (restore inland waters), 7.7 (pollution prevention), 10.3 (monitor & restore rivers)
	Sustainable management of river & coastal ecosystems	Irabere, coastal Uato-Carbau, Lacluta	5 (harvest mgmt), 9.7 (fisheries plan), 9.9 (ICM), 10 (ecosystem services)
	Restoration of degraded aquatic habitats and river corridors	Municipality-wide	2 (restore inland waters), 7.7 (pollution prevention), 10.3 (monitor & restore rivers)
	Soil conservation & erosion control in farming areas (linked to watershed protection)	Lacluta, Ossu, Uato-Lari, Uato-Carbau, Viqueque	2.5 (restore soil), 8.2 (reforest/soil protection), 9.20 (improved practices)
Bobonaro	Small fishing port to support artisanal coastal fisheries	Batugadé	5.1 (harvest & data), 9.9 (ICM & livelihoods), 9.10 (product quality)
	Fishing port at Aidabaleten with zoning to protect mangroves/lagoon	Atabae	1 (zoning), 5.2 (closed areas), 9.9 (ICM), 7.7 (pollution prevention)
	Conserve forested slopes of Loelako & Tapo/ Saburai to reduce erosion & protect water sources	South of Maliana	2.2 (reforestation), 8.2 (slope protection), 9.3 (forest mgmt), 10.6 (degraded land recovery)
Ermera	Small-scale freshwater aquaculture in suitable valleys	Railaco, Atsabe	9.15–9.19 (aquaculture development), 9.16 (support aquaculture families)
	Sustainable coffee farming & soil conservation on slopes (critical to watershed health)	Atsabe, Letefoho, Hatulia, Railaco	2.5 (soil restoration), 8.1 (climate-resilient agri), 9.20 (improved practices)
Aileu	Inland aquaculture potential (small ponds and community systems)	Municipality-wide	9.15–9.19, 9.16
Ainaro	Identified as suitable for aquaculture programmes	Municipality-wide	9.15–9.19, 9.16
Manufahi	Coastal small-scale fisheries & aquaculture sites	Municipality-wide	5 (harvest mgmt), 9.7 (fisheries plan), 9.8 (responsible fishing)
Liquiçá	Coastal fisheries opportunities for artisanal fishers	Coastline	5 (harvested species mgmt), 9.7 (fisheries plan)
RAEOA	Coastal marine resource use & fisheries	RAEOA coast	5 (harvest mgmt), 9.7 (fisheries action), 9.9 (ICM)
Dili/Ataúro	Artisanal fisheries and seaweed production (blue economy livelihood)	Ataúro Island	9.7 (sustainable fisheries), 9.15–9.19 (aquaculture dev.), 10.7 (seaweed as an alternative livelihood)

Table 12. Biodiversity-related activities in the tourism sector identified in the National Spatial Plan and their correspondence to NBSAP actions

Municipality	Biodiversity-Related Activities mentioned in the NSP	Specific Sites / Administrative Posts / Zones	Alignment with Relevant Target(s)
Lautém	Nature and coastal tourism potential (Eastern zone)	Eastern coast	3.4 (visitor services in/around PAs), 10.7 (seaweed/ alternative livelihood), 18.5 (eco-tourism as funding)
	Ecotourism linked to beaches, coral reefs, and Jaco Island	Tutuala–Com coastline, Jaco Island	3.4 (improve PA visitor services), 9.9 (sustainable coastal use), 18.5 (community eco-tourism)
	Construction of entrance gate and visitor infrastructure to support tourism	Valu Beach (Tutuala)	3.4 (visitor services), 3.1 (PA management), 18.5 (eco-tourism revenues)
	Trail between three lagoons to promote nature tourism	Com area	3.4 (PA tourism), 10 (ecosystem service awareness), 18.5 (eco-tourism)
	Identify and protect future tourism attraction points (cultural, natural, historical)	Mehara, Valu, NKST Park	1 (spatial planning), 3 (PAs/OECMs), 13.5 (biodiversity in tourism policy)
Baucau	Nature/beach/heritage tourism potential	Coastal zone, Baucau-Vila	3.4 (visitor services), 9.9 (sustainable coastal livelihoods), 18.5 (eco-tourism)
	Develop Tourism Aptitude Zones (TAZ) with biodiversity-friendly management	Baucau-Vila, Caibada beaches, Laga–Baguia road, Matebian, Legumau	1.2 (spatial tourism planning), 3.4 (PA tourism), 13.5 (biodiversity in tourism)
	Ecotourism & rural tourism on Mount Mundo Perdido & Matebian	Baguia, Venilale, Quelicai	3.4 (PA tourism), 9.9 (coastal–upland linkages), 18.5 (community eco-tourism)
	Beach & sea tourism linked to reefs and lagoons	Watabo'u, Be Amtan–Uailili, Lagoa Morumutu–Uailili, Caibada, Karavela	3.4 (visitor mgmt), 7.7 (prevent pollution), 9.9 (ICM & livelihoods)
Viqueque	Nature-based tourism linked to mountain PAs	Matebian, Mundo Perdido (Uato-Lari, Ossu)	3.4 (visitor services), 10 (ecosystem services awareness), 18.5 (eco-tourism)
	Tourism development associated with Lagoa Maurei	Uato-Carbau	3.4 (PA tourism), 10.3 (wetland restoration awareness), 18.5 (community tourism)
Bobonaro	Cultural tourism around Balibó town & nature	Balibó	3.4 (visitor experience near PAs), 18.5 (eco/cultural tourism)
	Coastal tourism linked to mangroves & wetlands	Batugadé, Be'e Malae Lagoon	3.4 (PA tourism), 9.9 (ICM), 10 (coastal ecosystem services)
	Spa and wellness tourism based on hot springs	Marobo	3.4 (visitor services), 10 (ecosystem services/health), 18.5 (eco-tourism)
Ermera	Ecotourism linked to coffee landscapes & mountains	Atsabe, Letefoho, Railaco	3.4 (visitor services), 9.22 (value-add coffee tourism), 18.5 (eco-tourism incomes)
Aileu	Nature and mountain tourism potential	Central highlands	3.4 (visitor services), 11.3 (green/blue spaces & trails), 18.5 (eco-tourism)
Ainaro	Highland ecotourism potential	Municipality-wide	3.4 (PA/landscape tourism), 18.5 (eco-tourism)
Manufahi	Coastal and inland eco-tourism potential	Coast & interior	3.4 (tourism in/near PAs), 18.5 (eco-tourism)
Liquiçá	Coastal/community-based ecotourism	Coastal zone	3.4 (visitor services), 9.9 (ICM), 18.5 (community tourism)
Covalima	Coastal and nature-based tourism	Suai coastal zone	3.4 (tourism in/near PAs), 18.5 (eco-tourism)
Oecusse-Ambeno	Coastal and cultural tourism potential	RAEOA coastal & cultural sites	3.4 (visitor services), 18.5 (eco/cultural tourism)
Díli / Ataúro	Marine ecotourism (coral reefs, diving, whale watching)	Ataúro Island	3.4 (marine PA tourism), 9.7 (Blue Economy fishing context), 18.5 (eco-tourism)

Table 13. Biodiversity-related activities in the Protected Area theme identified in the National Spatial Plan and their correspondence to NBSAP actions

Municipality	Biodiversity-Related Activities mentioned in the NSP	Specific Sites / Administrative Posts / Zones	Alignment with Relevant Target(s)
Lautém	Establish and manage Nino Konis Santana Natio nal Park	Tutuala, Lospalos, Lautém/Moro; sucos Com, Loré 1 & 2, Bauro, Cacavém, Fuiloro, Muapitine, Raça, Souro, Mehara	3 (30% PAs), 3.1 (PA management plans), 3.4 (visitor services), 3.8 (buffers/connectivity)
	Creation and management of Monte Legumau National Park (upland ecosystems)	Luro Administrative Post (Baricafa, Cotamutu, Lacawa, Wairoque)	3 (PAs), 3.1 (NP management), 3.7 (connectivity/gap analysis), 3.8 (buffers/connectivity)
	Creation and management of Lagoa Maurei Nature Reserve for species and wetland protection	Iliomar AP (Tirilolo)	2 (wetland restoration), 2.1 (map degraded coastal/marine), 3 (PAs), 3.1 (management), 10.6 (recovery of degraded lands)
	Establish ecological corridors between protected areas to improve connectivity	Municipality-wide	1 (integrated spatial planning), 1.1 (connectivity mapping), 3.7 (connectivity analysis), 3.8 (link/buffer PAs)
Baucau	Survey, classify and manage Mount Legumau & Mount Matebian	Laga, Baguia, Quelicai	3 (PA coverage), 3.1 (management plans), 3.7 (gap/connectivity analysis), 3.8 (buffers)
	Establish & maintain Municipal Ecological Structure (MES)	Vemasse, Venilale, Baguia, Laga, Quelicai	1 (integrated spatial planning), 1.1 (connectivity mapping), 3 (PAs/OECMs), 3.8 (connected landscapes)
Viqueque	Delimitation & management plans for multiple mountain protected areas *(Matebian, Mundo Perdido, Burabu'o, Aitana, Bibileo, Laretame, Builo)*	Uato-Lari, Ossu, Lacluta, Uato-Carbau	3 (30% PAs), 3.1 (PA management plans), 3.7 (connectivity/gaps), 3.8 (buffers/connectivity)
	Creation of reserve for Rusa timorensis deer	Uato-Lari	4 (threatened spp.), 4.2 (recovery plans), 4.3 (critical habitats), 4.4 (habitat inside PAs)
	Creation of reserve for Crocodylus porosus	Viqueque, Uato-Lari, Uato-Carbau	4 (threatened species), 5.4 (crocodile parks), 5.6 (human–croc conflict/IUU), 3.4 (tourism attraction)
Bobonaro	Protect Be'e Malae Lagoon (wetland, mangroves, birds)	Balibó / Atabae	2.1 (map degraded coastal areas), 2.3 (recover mangroves), 3 (PAs), 4.3 (critical habitats for birds)
	Support NP designation for Loelako & Tapo/Saburai and mountain corridor	Bobonaro uplands	3 (PAs), 3.1 (NP mgmt), 3.7 (connectivity analysis), 3.8 (corridor)
	Designate Mount Lakus/Sabi as Nature Reserve	Lolotoe	3 (PAs), 3.1 (management), 3.8 (connectivity), 4.3 (critical habitats)
	Strengthen Korluli Protected Area as ecological corridor	Shared Bobonaro–Maliana–Cailaco	3 (PAs), 3.7 (connectivity), 3.8 (buffers/adjacent PAs)
Ermera	Identify & protect ecological structure zones & natural resource areas	Atsabe, Hatulia, Letefoho, Railaco	1 (spatial planning), 1.1 (ecosystem map), 3 (OECMs), 20.4 (NBSAP monitoring obligations)
Covalima	Protection of biodiversity-rich areas (Tilomar)	Tilomar	3 (PAs), 3.1 (management plans), 3.7 (gap analysis)
RAEOA	Marine biodiversity protection as part of the national marine corridor / Atauro National Marine Park	Ataúro	3 (marine PAs), 3.6 (Atauro Marine Park), 3.11 (new marine PAs), 3.7 (connectivity)
Dili/Ataúro	Marine biodiversity protection linked to marine park & Blue Economy corridors	Ataúro	3 (marine PAs), 3.6 (Atauro NP), 3.11 (new marine PAs), 3.7 (connectivity)

7. MONITORING, EVALUATION AND LEARNING FRAMEWORK

7.1 Monitoring and Evaluation Strategy

A monitoring plan has been prepared as a companion document to this NBSAP. The plan provides details on the monitoring programme to be implemented under the NBSAP, enabling the development of the subsequent National Reports to the CBD. A monitoring plan is also about improving resource management and making improved policy decisions. Currently, there is limited historical data on which to base rigorous resource management regimes in Timor-Leste, and many new indicators will require initial surveys and baseline data to enable future trend analysis. The last land cover assessment data done at the country level by the government are from 2013, although forest cover change was monitored in 2019 (Cho and Lim 2023). The global level data is available but needs to be validated and remapped at the country level using adequate ground-truthing.

Recently, for fisheries, WorldFish began collecting marine catch data at many villages with LMMAs through paid enumerators and has continued the programme from 2018 to the present. Similarly, Blue Ventures has had a parallel voluntary program at two LMMAs. The best available trend data for management are from the WorldFish PeskASS[24] dataset on catch by species from 17 villages, dating back to 2018. These data are being used to determine catch per unit effort and trends over time by species, and to extrapolate to a total fish harvest. There is little data on populations of threatened species, and no population data are available for hunted or other wildlife to support management programmes. Protected areas have received limited support for access, facilities, and staffing, and require significant effort to survey, develop management plans, and ensure their protected status. Monitoring has been conducted so far only for two parks, so further expansion will be done. The monitoring will also help leverage technological solutions such as remote sensing and community-based monitoring.

The CBD, through various associated agencies (IUCN, FAO, WCMC, etc.), has developed generic indicators for several targets, most of which utilize global databases. The CBD has assigned the indicators as ‘headline’, ‘component ‘, and ‘complementary’. The headline and component indicators are adapted from the KMGBF global targets. Together, the three types of indicators will form the basis for the next series of National Reports to the CBD and can serve as the foundation for the country's monitoring programme. Some indicators are binary, while others are numeric and will deliver trends over time. The indicators were assessed and validated by

[24] “PeskAAS is one of the most sophisticated data collection systems for small-scale fisheries in the world. The open-source online dashboard tracks fishing activities in Timor-Leste, including the number and type of fish caught by individual boats in near real-time.” Details are available at: https://worldfishcenter.org/project/peskaas-automated-analytics-system-small-scale-fisheries-timor-leste

stakeholders during the meetings on 9-10 November 2023 and 4-5 April 2024 in Baucau, 6 October 2025 in Manufahi, 8 October 2025 in Dili, 9 December 2025 in Liquiça, and 11 December 2025 in Dili. For many indicators, at least partial data may be available and will be reassessed at the time of the 7th and 8th National Report.

7.2 Key Indicators for Measuring Conservation Progress

Table 14 outlines the multi-level indicator framework for Timor-Leste's NBSAP, aligning national monitoring with KMGBF and SDG commitments. Three types of indicators support each target:

- **Headline indicators:** Core, globally recognized measures (e.g., extent of ecosystems, (habitat extent) Red List indices, area restored, pollution indices). These allow international comparability and progress tracking against KMGBF. Reporting on the headline indicators from the KMGBF monitoring framework is requested, while component, complementary, and national indicators are optional.
- **Component and Complementary indicators:** More detailed thematic measures (e.g., management effectiveness of protected areas, connectivity of ecosystems, sustainable use indices, forest certification, policy integration). These provide depth on performance within each target. Additionally, indicators related to social and economic development encompass various factors, such as enhancements in local livelihoods, which can be measured through improvements in labor conditions and increased agricultural productivity. Furthermore, the levels of community engagement are vital, reflecting how actively residents participate in local governance and development initiatives.
- **National indicators:** Locally relevant measures tailored to Timor-Leste's context (e.g., number of marine protected areas established (live coral cover for marine environments), human-crocodile conflict cases, fish catch data, number of EIAs conducted (encompasses the screening assessments, public participation, and monitoring throughout the project implementation process), plastic import volumes, seaweed production, number of businesses reporting biodiversity risks, gender balance in committees).

Overall, the framework ensures i) Integration into KMGBF monitoring framework (e.g., IUCN Red List, Living Planet Index, METT, ecosystem service valuation); ii) National adaptation by using practical, context-specific metrics where global data are unavailable; and iii) Cross-cutting coverage across biodiversity drivers, ecosystem services, climate, pollution, invasive species, incentives, financing, monitoring, and gender equity. It is also important to develop a clear and realistic Key Performance Indicator (KPI) for different actions by respective ministries and departments once implementation of NBSAP starts.

Table 14. Headline, Component and complementary indicators for the Timor-Leste NBSAP

Target	Headline Indicators	Component Indicators	Complementary Indicators	National Indicators
1. Spatial planning	A.1 Red List of ecosystems A.2 Extent of natural ecosystems 1.1 Percentage of land and sea area covered by biodiversity-inclusive spatial plans	•	• Proportion of transboundary basin area with an operational arrangement for water cooperation	• % area where spatial plans implemented • Habitats with integrity mapped • Extent of natural ecosystems by type • Red List of ecosystems • Area of primary forest • Priority retention of intact/wilderness areas
2. Restore degraded habitats	• Area under restoration by ecosystem type (in progress/restored)	• Proportion of land that is degraded over total land area	• Global Ecosystem Restoration Index • Proportion of key biodiversity areas in favourable condition	• Area of remaining primary forest and specific critical ecosystems • Estimated area of degraded lands with map • Extent of natural ecosystems by type (area) • Maintenance/restoration of connectivity (area)
3. Protected areas	3.1 Coverage of protected areas and other effective area-based conservation measures •	•	• Rate of protected area downgrading, downsizing and degazettement events • International Union for Conservation of Nature Green List of Protected and Conserved Areas Standard • Proportion of key biodiversity areas in favourable condition • Number of protected areas that have completed a site-level assessment of governance and equity	• METT surveys at 2 parks • Improvements (e.g. better ecosystem condition and species populations including threatened species), habitat integrity and management effectiveness) at Nino Konis Park • Improved enforcement (officers, charges) • PAs & OECMs with management plans (new and revised) and undergone implementation • Number and area of OECMs (LMMAs, CFs) • PA coverage of KBAs • PA management effectiveness index • PA connectedness index
4. Threatened species	A.3 Red List Index A.4 populations within species with an effective with population size >500	• Living Planet Index • Number of (a) plant and (b) animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities • Green Status of Species	• Species Threat Abatement and Restoration metric • Red List Index (wild relatives of domesticated animals) • Number of island invasive alien species eradications	• Species status in IUCN & Timor-Leste Red List • # human–crocodile conflicts/year (number of people attacked by crocodile disaggregated by sex) • # threatened species with recovery plans (and implemented) • Cetacean centre established • # threatened species with improved status

		• Human–wildlife conflict Proportion of local breeds classified as being at risk of extinction		
5. Reducing unsustainable harvest of wild species	5.1 Proportion of fish stocks within biologically at sustainable levels •	• Red List Index (impacts of utilization for utilized species • Living Plante Index (LPI) for utilzed species • Sustainable • Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated (IUU) fishing	• Inland fisheries threat indicator • Red List Index (for internationally traded species) • Red List Index (impacts of fisheries) • By-catch of vulnerable and non-target species • Number of Marine Stewardship Council chain of custody certification holders by distribution country • Biodiversity-based trade, growth rates	• # communities (men and women) educated on wildlife and wild plant management • # violation in hunting, fishing, and harvesting species under CITES • # illegal fishing vessels in TL waters • Estimated total fish catch and harvest of wild edibles (tons, by species)
6. Invasive species	6.1 Rate of invasive species established	•	• Red List Index (impacts of invasive alien species)	• # of introduction pathways controlled • # customs agents trained • # invasive species with control plans • Rate of spread of invasive species • Impacts of invasive species
7. Pollution	7.1 Index of coastal eutrophication 7.2 Pesticide environment concentration and or aggregated total applied toxicity	• Cropland nutrient budget • Proportion of domestic and industrial wastewater flows safely treated • Plastic debris density • Red List Index (impact of pollution)	• Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities • Hazardous waste generation per capita • Trends in the amount of litter, including microplastics, in the water column and on the seafloor • Pesticide use per area of cropland	• # of use of Imported fertilizers (FAOSTAT) • Imported pesticides (FAOSTAT) • Extension programme on alternative fertilizers and pesticides and its adoption • Extent of agriculture near coast/river
8. Climate change	8.b Policies to minimize the impact of climate change and ocean acidification on biodiversity and to minimize negative and	• Bioclimatic Ecosystem Resilience Index	• Above-ground biomass stock in forest (tons/ha) • National greenhouse gas inventories from land use, land-use change and forestry	• Integrated climate adaptation plan designed and implemented • Area of forest replanted • # crop species improved for adaptation • Area under carbon farm developed/restored

	foster positive impacts of climate action on biodiversity		• Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	• Climate regulation services by ecosystem • National GHG inventories from land/land use change • Climate & DRR strategy in place • Area of forest cover and AGB by type
9. Wild species management and sustainable use	9.1 Benefits from the sustainable use of wild species 9.2 Percentage of the population in traditional occupations	• Red List Index (species used for food and medicine) • Living Planet Index for utilized species	• Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing • Number of Marine Stewardship Council chain of custody certification holders by distribution country • Number of (a) plant and (b) animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities • Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size • Red List Index (impacts of fisheries)	• Number of households with different wellbeing status benefiting from sustainable wild species-based livelihoods • Average household income from NbS-based livelihoods • Number of SMEs supported, including women- and youth-led enterprises in different sectors • Number of national and municipal plans integrating wild species livelihood indicators. • # people (men and women) using wild resources (food, energy, culture, etc.) • Implementation of instruments against Illegal, Unreported and Unregulated (IUU) fishing
10. Sustainable resource management	10.1 Proportion of agricultural area under productive and sustainable agriculture 10.2 Progress towards sustainable forest management •	• Average income of small-scale food producers by sex and indigenous status • •	• Agrobiodiversity Index • Soil organic carbon stocks • Red List Index (wild relatives of domesticated animals) • Red List Index (forest specialist species) • Red List Index (impacts of fisheries) • Proportion of local breeds classified as being at risk of extinction • Proportion of land that is degraded over total land area • Area of forest under sustainable management: total	• Forests: Forest area under approved management plan • Number of illegal logging infractions recorded per year • Area of forest restored (planted or regenerated) supporting livelihoods • # community forests • Area of certified forest • Avg. income of small-scale food producers by sexAgriculture: % agricultural area under sustainable agriculture • Agriculture: Area of slash/burn agriculture • #/area of agroforests, gene banks, improved crop varieties • Fisheries: Estimated total catch

			forest management certification	• Aquaculture: National registry in AquaGRIS. • # managed species, fisher loans, marine research centre • #/area of LMMAs Aquaculture: # hatcheries, tons sustainable fish, # farmers trained, pond area
11. Restore ecosystem services	• B.1 Services provided by ecosystems	• Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities • Proportion of bodies of water with good ambient water quality • Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	• Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management • Proportion of population using safely managed drinking water services • Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) • Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	• Water quality standards developed • Integrated water management plan • Number of seaweed production industry practicing different environmental standards • Value of ecosystem services (crop, fish, forest, aquaculture, tourism, handicrafts)
12. Urban green/blue spaces	12.1 Average share of the built-up areas of cities that is green/blue space for public use for all	• Recreation & cultural ES provided	•	• Area of waterfront improved in Dili
13. Nagoya Protocol	C.1 Monetary benefits received in accordance with applicable internationally agreed access and benefit sharing instruments C.2 Non-monetary benefits arising from applicable international access and benefit sharing instruments	• Total number of internationally recognized certificates published on the Access and Benefit-sharing Clearing-House	• Total number of transfers of crop material from the Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture received in a country • Number of users that have provided information relevant to the utilization of genetic resources to designated	• Accession process completed • # community capacity-building workshops

			checkpoints • Number of checkpoint communiqués published on the Access and Benefit-sharing Clearing-House • Total number of internationally recognized certificates of compliance for non-commercial purposes in the Access and Benefit-sharing Clearing-House	
14. Mainstreaming biodiversity policies	14.b Integrating biodiversity and its multiple values into policies, regulations, planning, development processes, poverty eradication strategies and, as appropriate, national accounts, within and across all levels and across all sectors, and progressively aligning all relevant public and private activities and fiscal and financial flows with the goals and targets of the Framework	• Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental Economic Accounting	•	• Policy assessment for biodiversity • National environment committee established • # EIAs conducted • Number of policies integrating or incorporating biodiversity in different sectors
15. Businesses	15.1 Number of companies disclosing their biodiversity-related risks, dependencies and impacts	• Number of companies publishing sustainability reports	• Number of organizations within the country that have signalled an intent to start adopting the recommendations of the Taskforce on Nature-related Financial Disclosures	• # of companies piloting and instituting reporting • Reports on risks, dependencies, impacts • # companies with mitigation measures
16. Consumption & waste	16.b developing, adopting or implementing policy instruments aimed at encouraging and enabling people to make sustainable consumption choices	• Food waste index • Material footprint, material footprint per capita, and material footprint per GDP • Ecological footprint	• National recycling rate, tons of material recycled • Human appropriation of net primary production • Change in water-use efficiency over time • Indicators from the Life Cycle Impact Assessment Programme	• Volume (tons) of solid waste by type • Volume (tons) of waste recycled by type • Plastic waste policies revised • Integrated waste management plan • # educational materials for schools
17. Biosafety	17.b Action to implement biosafety measures as set	• None	• Indicators related to the	• Biosafety measures in place (lab)

	out in Article 8(g) of the Convention and measures for the handling of biotechnology and the distribution of its benefits as set out in Article 19		Cartagena Protocol on Biosafety	• Cartagena Protocol implementation (non-member) • Biosecurity capacity improved • Risk management measures in place
18. Incentives	18.1 Positive incentives in place to promote biodiversity conservation and sustainable use 18.2 Value of subsidies and other incentives harmful to biodiversity	• Revenue generated by biodiversity-relevant tradable permits (if auctioned) • Monetary value of payments for ecosystem services • Monetary value of biodiversity offsets	•	• # incentives removed • Positive incentives implemented • New incentives assessed for biodiversity • Value of harmful subsidies eliminated/reformed
19. Funding	• International public funding, including official development assistance for conservation and sustainable use of biodiversity and ecosystems • Domestic public funding on conservation and sustainable use of biodiversity and ecosystems • Private funding (domestic and international) on conservation and sustainable use of biodiversity and ecosystems	•	• Proportion of total research budget allocated to research in the field of marine technology • Total amount of funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies • International funding targeted at local communities within biodiversity-related activities, youth within biodiversity-related activities, and gender equality and women's rights policy objectives within biodiversity-related activities • Monetary value of the annual budget for biodiversity from total national budget • Percentage of annual biodiversity expenditure in total national government budgets • Domestic funding targeted at local communities within biodiversity-related activities,	• Biodiversity Finance Plan in place • GEF funding • FDI, ODA, South-South as % budget • % research budget on marine tech • # PES programs

			youth within biodiversity-related activities, and gender equality and women's rights policy objectives within biodiversity-related activities • Private targeted at local communities within biodiversity-related activities, youth within biodiversity-related activities, and gender equality and women's rights policy objectives within biodiversity-related activities	
20. International cooperation	20.b Action to strengthen capacity-building and development and access to and transfer of technology, and to promote the development of and access to innovation and technical and scientific cooperation	• Total amount of funding to promote the development, transfer, dissemination and diffusion of environmentally sound technologies	• Researchers (in full-time equivalent) per million inhabitants) • Number of joint scientific papers published in the Ocean Biodiversity Information System by sector • Proportion of total research budget allocated to research in the field of marine technology • Volume of official development assistance flows for scholarships by sector and type of study • Global imports of information and communications technology goods as presented by bilateral trade flows by information and communications technology goods category • Total amount of funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies	• Number and type of projects with universities, museums, agencies (capacity building) • National environment committee priorities/training needs • # development projects with/without biodiversity
21. Monitoring & data	• 21.1 Indicator on biodiversity information	• Species Information Index	• Growth in number of records and species in the Living Planet	• National biodiversity database • Growth in OBIS records

	for monitoring the Kunming-Montreal Global Biodiversity Framework	• Participation of local communities in decision making related to the implementation of the Convention at all levels • Index of Linguistic Diversity	Index database • Growth in species occurrence records accessible through the Global Biodiversity Information Facility • Growth in marine species occurrence records accessible through the Ocean Biodiversity Information System • Proportion of known species assessed through the International Union for Conservation of Nature Red List of Threatened Species • Number of assessments on the International Union for Conservation of Nature Red List of Threatened Species	• Study on regional monitoring techniques • # staff trained (disaggregated by sex) • # community sampling programs • Establishment of Aquatic Foods and Freshwater Biodiversity Knowledge Programme
22. Gender, youth, disadvantaged persons	22.1 Land-use change and land tenure in the traditional territories of local communities 22.b Action towards the full, equitable, inclusive, effective and gender-responsive representation and participation in decision making, and access to justice and information related to biodiversity by indigenous peoples and local communities, respecting their cultures and their rights over lands, territories, resources and traditional knowledge, as well as by women and girls, children and youth, and persons with disabilities, and the full protection of environmental human	• Participation of local communities in decision making related to the implementation of the NBSAP at all levels •	• Participation of local communities in decision making related to the implementation of the Convention at all levels • (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure • The legal framework (including customary law) guaranteeing women's equal rights to land ownership and/or control • Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group • Area covered by the reported territories and areas governed,	• Number of men, women and people of disadvantaged communities in the National environment committee • Proportion of individuals with legally recognized or secure tenure rights to land, disaggregated by gender • % positions in institutions (sex, age, disability) • PAs with SAGE governance assessments • Land-use change and land tenure in communities • % seats held by women in parliament/local govt. • National implementation of CBD gender plan

	rights defenders 23b. Existence and implementation status of national legal, administrative, and policy frameworks in Timor-Leste aligned with the Gender Plan of Action (2023–2030) to ensure that all women and girls have equal opportunity and capacity to contribute to the three objectives of the Convention, including by ensuring women's equal rights and access to land and natural resources.		managed and conserved by custodian local communities (ICCAs—territories of life)	

7.3 Monitoring Framework

The monitoring framework presents baseline information, national targets, and responsible organizations in a structured and actionable manner. While this framework provides a national-level overview, more detailed sector-specific monitoring documents can be developed by the respective ministries and departments—particularly those working on agriculture, forestry, fisheries and aquaculture, protected areas, and tourism. These detailed frameworks may include advanced data collection methodologies, disaggregated indicators (e.g., gender, geography), frequency of reporting, and resource requirements for systematic monitoring.

The monitoring framework presented in the **Annex 6** provides a structured system for tracking progress in implementing the updated NBSAP across Timor-Leste's key biodiversity-related sectors. It outlines the baseline conditions, measurable targets, indicators, and responsible organizations for each action under the NBSAP. By organizing monitoring elements in a single consolidated table, the framework enables ministries and stakeholders to clearly identify what needs to be measured, how it will be measured, and who is responsible for reporting progress.

The framework covers all major thematic areas—agriculture, forestry, fisheries and aquaculture, tourism. For each target, the monitoring table specifies relevant indicators (quantitative or qualitative), baseline values where available, desired outcomes by 2030, and institutional responsibilities at national and municipal levels. This allows for transparent reporting, early identification of implementation gaps, and evidence-based decision-making. Overall, the monitoring framework ensures strong alignment with KMGBF, national priorities, and SDG commitments. It is designed to guide coordinated monitoring efforts, strengthen accountability, and support adaptive management throughout NBSAP implementation up to 2030.

8. CROSS-CUTTING STRATEGIES

Women, men, youth, PwD, and marginalized groups often interact with biodiversity and ecosystem services in different ways, shaped by their roles, responsibilities, and access to resources. Recognizing these differences and ensuring inclusive participation is essential to achieving equitable and sustainable outcomes. Therefore, GEDSI are critical for the effective conservation, management, and sustainable use of biodiversity in Timor-Leste.

Timor-Leste's diverse ecosystems, including forests, mangroves, coral reefs, and agroecosystems, are crucial to the country's livelihoods, food security, and cultural identity. Women, youth, and local communities play a vital role in biodiversity management. Over 70% of the population relies on natural resources, with women and local communities leading in seed conservation, forest management, and nearshore fishing. Although women make up 47% of the workforce and contribute significantly to agriculture and coastal livelihoods, they occupy fewer than 20% of formal decision-making roles in environmental institutions. Women, youth, and local communities' roles are also apparent in rural tourism, mainly in handicrafts, hospitality, and performances to entertain guests.

With 60% of the population under 25, youth are positioned to drive innovation, conservation, and green enterprise development. Yet youth unemployment remains high at 14%, and opportunities to participate in environmental programs and eco-tourism are limited. Local communities, especially in Manufahi, Lautém, Covalima, and Atauro, possess valuable traditional ecological knowledge and resource management systems; however, their roles and rights are not fully reflected in national biodiversity policies. However, biodiversity and ecosystem degradation threaten livelihoods in Timor-Leste, particularly for women, youth, and local communities. Deforestation, soil degradation, and habitat loss reduce food production and incomes. Women are particularly affected, underscoring the need for gender-responsive planning that actively engages them in developing solutions.

Integrating GEDSI into biodiversity conservation can thus deliver multiple benefits. Inclusive decision-making processes ensure that biodiversity policies and projects reflect the needs and priorities of all community members. For instance, providing women and marginalized groups with access to training, credit, and technology enhances their ability to adopt sustainable practices such as agroforestry, eco-tourism, and small-scale aquaculture. Involving youth in conservation education and community-based monitoring builds a new generation of environmental stewards. Furthermore, equitable benefit-sharing from eco-enterprises, PES schemes, or eco-tourism ensures that conservation generates tangible livelihood improvements for the entire population. A detailed Gender Plan of Action and a Strategy for Local Community Participation that adopts a Rights-Based Approach (RBA) are described below. Key GEDSI-related issues under each action of NBSAP are presented in **Annex 7**.

8.1 GEDSI Action Plan and Strategy

CBD COP Decision 15/11 urges Parties to implement the "Gender Plan of Action". This plan promotes a gender-responsive approach to applying the implementation mechanisms of the Global Biodiversity Framework across the NBSAP. Timor-Leste's commitments under KMGBF (Target 22 and 23 on gender equality), the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), and the Sustainable Development Goals (SDGs 5, 10, 13, and 15) require that biodiversity strategies be explicitly gender-responsive and socially inclusive. The National Action Plan on Gender-Based Violence (2017-2021)[25] and the National Strategy for Social Protection (2021)[26] provide complementary frameworks for embedding GEDSI in conservation. GEDSI embedded in the NBSAP is guided by the Maubisse Declaration (2022) and aligned with the four key priorities of the Secretary of State for Equality (SEI).

8.1.1 Key GEDSI-Responsive Global Policies

KMGBF focuses on inclusion, fairness, and gender equality. KMGBF Targets 22 and 23 are significant for NBSAP. They guide inclusive participation, access to justice, and gender-responsive biodiversity action:

- **Target 22** calls for *full, equitable, effective, and gender-responsive participation* in biodiversity decision-making by IPLCs, women, youth, children, and PwD. It also highlights the need to respect customary rights to land, territories, and natural resources, while ensuring protection for environmental human rights defenders[27].
- **Target 23** commits Parties to achieving *gender equality* through a gender-responsive approach that enables all women and girls to exercise equal rights, access resources, and participate in leadership roles in biodiversity-related policy, decision-making, and implementation processes[28].

Through these targets, CBD stresses that NBSAP implementation should guarantee procedural rights (information, participation, justice) and substantive rights (lands, territories, resources, culture) in biodiversity planning and management. These commitments advance Timor-Leste's goal of inclusive and equitable biodiversity management. The NBSAP incorporates these targets, ensuring gender-responsive and inclusive engagement of women, youth, and local communities at all levels, from community-based conservation to national policy. In addition, the KMGBF's focus on gender equality complements broader international human rights frameworks, including the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)[29] and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)[30].

[25] https://www.undp.org/sites/g/files/zskgke326/files/2024-08/spotlight_genderjusticereport_full_en.pdf
[26] https://faolex.fao.org/docs/pdf/tim214765E.pdf
[27] https://www.cbd.int/gbf/targets/22
[28] https://www.cbd.int/gbf/targets/23
[29] https://www.ohchr.org/sites/default/files/Documents/ProfessionalInterest/cedaw.pdf
[30] https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

The CEDAW General Recommendation No. 39 (2022) recognizes that the rights of Indigenous women and girls derive not only from CEDAW but also from instruments such as ILO Convention No. 169 (1989) concerning Indigenous and Tribal Peoples. Together, these frameworks establish a coherent foundation for ensuring that the NBSAP promotes the full participation, empowerment, and protection of women and Indigenous communities in biodiversity governance. By aligning with global and regional commitments, Timor-Leste's NBSAP bridges international obligations and local realities, ensuring biodiversity conservation supports gender equality, cultural integrity, and sustainable livelihoods for all.

8.1.2 Alignment with National Policies and Plans

This section is prepared as per the inputs received from the Secretary of State for Equality (SEI). These issues, along with inputs from the stakeholders, have been incorporated into the relevant sections of the document.

Alignment with the Maubisse Declaration

The Maubisse Declaration on Gender Equality and Climate Action calls for all ministries to mainstream gender in environmental, climate, and agricultural policies. It assigns specific responsibilities to the National Directorate of Environment (NDE) and MAF (now MALFF) to ensure that women, particularly in rural areas, have equitable access to resources, opportunities, and decision-making roles in biodiversity and environmental management.

Key Maubisse Commitments relevant to the NBSAP are as follows.

- Ensure 30% of rural women have access to renewable and clean energy.
- Support 2,000 families (including women-headed households) to adopt alternative energy (Fugaun Foun Timor).
- Enhance women's knowledge on climate change, disasters, and environmental degradation.
- Ensure 50% of rural women participate in environmental management and impact assessments.
- Promote 30% rural women's employment in Protected Areas and National Parks.
- Strengthen institutional capacity to collect sex-disaggregated environmental data.

Points relevant for the Ministry of Agriculture and Fisheries (MAF/MALFF) are as follows.

- Implement the National Gender Equality Policy at national and municipal levels.
- Ensure 40% of women are beneficiaries of agricultural programs.
- Support 30% young women in horticulture and fruiticulture sectors.
- Promote 30% women extensionists at municipal level.
- Build MALFF capacity to collect sex-disaggregated data.
- Promote women's leadership in agricultural decision-making.
- Foster sustainable agriculture, fisheries, and food security for women.

Alignment with the Timor-Leste's NAP (National Action Plan on Women), Peace and Security

The NAP 1325 (2024-2028) aims to imbibe and improve from the experiences of the first phase: the first phase implementation proved efficacious in empowering women with the relevant

tools for promotion of non-violent resolution mechanisms. Recognizing the important contribution of past women fighters and veterans of the struggle for independence, NAP 1325 (2024-2028) seeks to enable all women to enjoy equal right to justice, recognition and freedom from discrimination. Therefore, the NAP 1325 continues to expand the contours of women's roles in decision making in the security and justice sectors in all levels of governance, given that these are factors seminal for a more effective and sustainable recovery phase in the process of peacebuilding. The implementation of the second phase of NAP 1325 is now focused on the Four Pillars and one of the Pillars is the Participation Pillar with its aims to achieve the following:

- Increase and promote women's full, equal and meaningful participation in national institutions across areas including security, defence and justice and humanitarian actions.
- Increase participation and representation of women in all their diversity in leadership and decision-making positions in the security, defence and justice sectors at both local and national levels, including civil society organizations.
- Improve and strengthen the Participation Pillar by promoting 30% quota of equal, meaningful and active participation of women in decision making roles across governance, peace and security and humanitarian actions sectors.
- Review and ensure gender perspectives are integrated into laws, policies, and programs on peace and security and humanitarian actions, and ensure its development and implementation with the maximum participation of all stakeholders, including women from diverse backgrounds, including women with disabilities and survivors of violence in conflicts.

Integration with the Four SEI Key Priorities

(A) Institutional Capacity Building

- Strengthen the institutional capacity building at national and municipal authorities to apply gender-responsive planning and budgeting within biodiversity programs.
- Develop technical skills for staff to conduct gender and social inclusion analyses during Environmental Impact Assessments (EIAs) and biodiversity monitoring.
- Build cross-ministerial coordination mechanisms between SEI, Environment, and MALFF to monitor progress against gender-related indicators in biodiversity and agriculture.

(B) Prevention of Gender-Based Violence (GBV)

- Incorporate GBV risk assessment into NBSAP implementation, especially for rural programs involving community engagement and resource use.
- Promote safe, inclusive work environments in biodiversity and agricultural sectors by adopting Codes of Conduct and community-based awareness on women's safety and rights.

- Link biodiversity livelihood programs (eco-tourism, forestry, renewable energy) with GBV prevention and response networks to reduce economic dependency and strengthen women's autonomy.

(C) Promotion of Women's Participation in Politics and Decision-Making

- Ensure gender-balanced representation (minimum 40%) in local biodiversity committees, protected area management boards, and agricultural cooperatives.
- Support women leaders at suco (village) and municipal levels to actively engage in biodiversity planning and resource allocation decisions.
- Promote capacity-building programs for rural and young women in environmental governance.

(D) Economic Empowerment of Women

- Expand women's access to biodiversity-related green enterprises — including eco-tourism, handicrafts, sustainable fisheries, and agroforestry.
- Provide training and finance (microcredit, grants) for women and youth to develop biodiversity-based value chains in rural areas.
- Link NBSAP's livelihood components with SEI's Women's Economic Empowerment Strategy, ensuring rural women gain tangible benefits from sustainable biodiversity use.
- Support the Maubisse goals to provide clean energy access and promote alternative livelihoods (Fugaun Foun Timor) that reduce environmental pressure and empower women economically

Cross-Sectoral Collaboration for NBSAP

- Integrate GEDSI indicators into all NBSAP targets and actions, with clear baselines and measurable outcomes.
- Ensure data collection across biodiversity sectors is sex-, age-, and disability-disaggregated, wherever appropriate.
- Recognize and promote women's traditional ecological knowledge in biodiversity conservation, seed preservation, and natural medicine.
- Develop inclusive communication and education programs on biodiversity that reach rural women, youth, and marginalized communities.
- Monitor progress through a joint reporting mechanism involving SEI, NDE, and MAF, in alignment with the Maubisse Declaration.

8.1.3 Objectives and Scope of the GEDSI Action Plan

The GEDSI ensures the NBSAP (2026–2030) is gender-responsive, inclusive, youth-driven, and community-owned. It promotes equity, participation, and fair benefit-sharing in all biodiversity initiatives, in line with KMGBF Target 23 and national priorities. Specifically, the GAP aims to:

- Mainstream GEDSI across all NBSAP targets, strategies, and implementation processes, ensuring that biodiversity policies, budgets, and institutional mechanisms recognize and respond to the distinct roles and needs of women, youth, local communities, and PwD.

- Strengthen participation and leadership of women, youth, and local communities in biodiversity governance and decision-making at national, municipal, and community

levels, ensuring equitable representation in committees, protected area management, restoration projects, and biodiversity-related enterprises.

- Promote equitable access to natural resources, benefits, and livelihood opportunities, especially in agriculture, forestry, fisheries, and eco-tourism, by creating enabling environments that support the participation of women and marginalized groups in biodiversity-based value chains and conservation initiatives.

- Institutionalize GEDSI monitoring, financing, and accountability within the NBSAP framework, including disaggregated data systems, gender-responsive budgeting, and inclusive reporting linked to the national biodiversity database and CBD commitments.

8.1.4 Key strategies

Moving forward, implementing GEDSI policy in Timor-Leste's NBSAP will ensure:

- **Strengthening women's and marginalized groups' participation in biodiversity governance structures at national and local levels**: Women, youth, PwD, and other marginalized groups often face barriers to participation in decision-making. To address this, biodiversity projects and policies must actively include their input and representation. Gender-balanced participation will be ensured in the interdepartmental environmental committee and other biodiversity-related governance bodies. Furthermore, opportunities will be created for ecological defenders and community representatives to engage in consultations on biodiversity and development projects. These measures will help ensure that all voices are reflected in biodiversity governance, leading to more inclusive and equitable outcomes.
- **Conducting gender analysis of ecosystem services to understand differentiated benefits and burdens**: Ecosystem services confer different benefits and impose different burdens on women, men, and vulnerable groups. Gender impact assessments are needed for each sector to better understand these differences and ensure that biodiversity policies -reflect the realities of all groups. Such assessments must also integrate traditional knowledge and local perspectives, recognizing the value of cultural practices and community-based approaches in conservation. This will create a more accurate picture of how biodiversity contributes to livelihoods and well-being, while also identifying gaps where certain groups may be disproportionately burdened.
- **Designing conservation projects with equitable access to resources, finance, training, and technology**: Government will ensure that future biodiversity projects are designed to guarantee equitable access to these for women and marginalized groups. All new conservation and restoration projects will thus include dedicated components that address gender and minority issues to ensure fair participation. Providing women and marginalized groups with access to financial resources and modern technologies will empower them to adopt sustainable practices such as agroforestry, aquaculture, and eco-tourism. Capacity-building initiatives and targeted training will further strengthen their ability to contribute to conservation and derive tangible livelihood benefits.

- **Ensuring that monitoring and reporting frameworks track gender and social inclusion outcomes alongside biodiversity indicators**: National biodiversity monitoring systems will not only track ecological outcomes but also report on gender and social inclusion-related outcomes. Indicators will include the number of women, youth, and marginalized groups engaged in biodiversity governance, community-based monitoring, and benefit-sharing mechanisms. Reporting frameworks will be designed to regularly measure progress on gender-responsive outcomes, ensuring that equity considerations are mainstreamed into biodiversity conservation. By aligning these efforts with CBD and NBSAP reporting obligations, Timor-Leste can demonstrate progress in both biodiversity protection and social inclusion.
- **Integration of local knowledge, cultural values and norms**: Target 22 of the NBSAP (2026-2030) is gender-focused and state the following: By adopting a GEDSI lens, Timor-Leste can not only conserve its biodiversity but also ensure that conservation contributes to social justice, poverty reduction, and sustainable development. Local communities have a cultural and holistic understanding, rooted in their traditional knowledge, practices, and innovation. This knowledge can play a fundamental role in developing conservation initiatives that integrate cultural values and traditional governance systems. Involving local communities in biodiversity conservation and recognizing their perspectives and expertise will strengthen context-specific and effective conservation strategies.
- **Ensuring integration of rights-based approaches in planning, implementation, and monitoring:** The NBSAP also recognizes the importance of meaningful participation of women and girls, as well as the inclusion of children, youth, and PwD, in promoting social equity and empowering these groups to actively contribute to biodiversity conservation. It highlights the need to protect environmental human rights defenders, who are at the forefront of safeguarding biodiversity by monitoring and exposing environmental violations, promoting sustainable practices, and advocating for a human rights-based approach (HRBA) to conservation.

8.1.5 Strategic Actions and Activities

Table 15 presents a structured overview of gender-responsive actions to guide the implementation of Timor-Leste's NBSAP (2026–2030). This is grouped in five strategic areas: (A) gender mainstreaming in policy and planning, (B) participation and decision-making, (C) equitable access to resources and benefits, (D) capacity building and awareness, and (E) data, monitoring, and reporting. For each strategic area, the table specifies key actions, responsible institutions, timelines, and indicators to track progress. This format ensures clarity on roles and responsibilities, facilitates monitoring, and provides an implementation roadmap that government, partners, and communities can adopt. Gender-related issues relevant for NBSAP Actions are presented in **Annex 7.**

Table 15. Summary of GEDSI-responsive action plan

Strategic Area	Actions	Responsible Institutions	Timeline	Indicators
A. Gender mainstreaming in policy & planning	Integrate GEDSI into all NBSAP targets, indicators, and monitoring systems. Recruiting or designating a gender focal point at the government level for biodiversity and environmental issues	Dept. of Environment (DoE), SEI (Secretary of State for Equality) , MALFF	2026–2030	% of NBSAP targets with gender-responsive indicators (Details are under each Action, Table 14 and Annex 7)
	Establish a National Gender & Biodiversity Working Group within the inter-ministerial biodiversity committee.	DoE, SEI, CSOs	2026	Working group established & active
B. Participation & decision-making	Ensure at least 40% women and 80% youth representation in biodiversity committees (national, municipal, community).	DoE, Municipal Governments, NGOs	Ongoing	% of women/youth in committees
	Support leadership training programs for women in biodiversity governance and community forest/fishery groups.	NGOs, CSOs, MALFF	2026–2030	# of women trained & holding leadership roles
C. Equitable access to resources & benefits	Strengthen women's land tenure rights in community-managed forests and coastal areas (Tara Bandu).	SEI, Land Commission, MALFF	2026–2030	# of women with secured tenure/use rights
	Ensure women and marginalized groups benefit from payments for ecosystem services (PES), biodiversity credits, and livelihood projects.	DoE, MALFF, Finance Ministry	Ongoing	% of PES/credit beneficiaries who are women
D. Capacity building & awareness	Conduct gender-sensitive awareness programs on biodiversity, sustainable consumption, and ecosystem services at community level.	DoE, NGOs, SEI	Ongoing	# of programs held; % female participants

	Integrate gender and biodiversity modules into school curricula and university programs.	Ministry of Education, Universities	2028–2030	# of Modules developed & integrated
E. Data, monitoring & reporting	Collect and report sex-disaggregated data for all biodiversity indicators (esp. livelihoods, participation, benefit-sharing).	DoE, SEI, Statistics Office	Ongoing	% of indicators reported with sex-disaggregated data
	Conduct a mid-term gender audit of NBSAP implementation.	DoE, SEI, UNDP	2028	Audit completed; recommendations integrated

8.1.6 Expected Outcomes

- **Gender equality and women's empowerment are integrated across all NBSAP targets**, ensuring that biodiversity strategies and actions respond to the differentiated roles, needs, and contributions of women, men, youth, PwD, and other marginalized groups.
- **Women, youth, and marginalized groups actively participate and assume leadership roles in biodiversity governance** at both national and local levels through inclusive consultation processes, balanced representation in committees, and strengthened community-based decision-making.
- **Equitable access to the benefits of biodiversity conservation and sustainable use is promoted**, including fair opportunities to access land, financial resources, training, technology, and livelihood benefits from eco-tourism, agroforestry, aquaculture, and payment for ecosystem services.
- **Monitoring and reporting frameworks systematically apply sex-disaggregated data and gender-sensitive indicators**, enabling adaptive management of biodiversity while tracking social equity and inclusion outcomes alongside ecological targets.
- **Timor-Leste demonstrates concrete progress toward KMGBF Target 22 and 23, aligning with KMGBF Gender Plan of Action Gender Plan of Action, and national commitments on gender equality**, including the CEDAW and the National Policy on Social Inclusion, positioning biodiversity conservation as both an environmental and social justice priority.
- **Local Knowledge and cultural values are incorporated** into biodiversity-related plans, programmers, policies, strategies, directives, and other government decisions
- **Rights-based approach integrated** throughout planning, implementation, monitoring and evaluation.

8.2 Local Community Participation and Rights-Based Approach

Local communities in Timor-Leste are custodians of rich traditional knowledge, practices, and governance systems that have sustained biodiversity for generations. Their cultural, spiritual, and subsistence ties to forests, rivers, coastal zones, and marine ecosystems make them key actors in biodiversity conservation, restoration, and sustainable use. Recognizing and respecting these rights and contributions is critical to achieving KMGBF and SDGs.

A rights-based approach to biodiversity conservation emphasizes protecting local community tenure on land, fisheries and coastal ecosystems, customary governance, community-based coastal and marine tenure, and cultural heritage, while ensuring free, prior, and informed consent (FPIC) in decision-making processes. FPIC will follow the principle and process by which local communities are given the right and opportunity to make decisions about biodiversity-related policies, plans, and actions that may affect their lands, territories, resources, livelihoods, cultural heritage, or traditional knowledge. Under the Timor-Leste NBSAP, FPIC ensures that biodiversity conservation and sustainable use measures are rights-based, inclusive, and conflict-sensitive, and that they respect customary governance systems (e.g., *tara bandu*), land and resource tenure, and traditional knowledge. Applying FPIC strengthens local ownership, reduces social conflict, enhances the effectiveness of conservation outcomes, and aligns NBSAP implementation with national law, international safeguard standards, and the Kunming–Montreal Global Biodiversity Framework.

FPIC can be done for PA management, restoration and watershed interventions, LMMAS and CF management, and ABS implementation. This approach not only protects local community rights but also enhances the legitimacy, sustainability, and equity of conservation actions.

8.2.1 Key Principles:

- **Inclusive participation:** Timor-Leste government will ensure local communities are meaningfully engaged in biodiversity governance structures at national, municipal, and community levels, including in the implementation, and monitoring of NBSAP targets.
- **Rights-Based and People-Centric Biodiversity Governance:** NBSAP implementation will adopt a people-centric, decentralized, local responsibility and accountability, equitable, and collective governance approach to biodiversity governance, making sure actions are grounded in collaborative and equitable governance that respects procedural rights (information, participation, and justice) and substantive rights (lands, resources, culture, and traditional knowledge), ensuring Indigenous Peoples and local communities are recognized as rights-holders and co-managers.
- **Recognition of traditional knowledge:** Government will integrate customary knowledge systems and community-driven practices, such as *tara bandu*, into conservation

planning, protected area management, and ecosystem restoration while implementing the NBSAP.

- **Equitable benefit-sharing:** It is important to guarantee that local communities benefit from biodiversity-related initiatives, including eco-tourism, community forestry, aquaculture, carbon markets, and payment for ecosystem services (PES), so NBSAP takes this into account.
- **Human rights protection:** The principle of protecting environmental human rights defenders, community leaders, and local organizations advocating for biodiversity, ensuring that conservation does not lead to exclusion, displacement, or loss of rights is embedded in NBSAP.
- **Capacity and empowerment:** Strengthening local communities' capacity through access to training, financial resources, and technology, enabling them to lead conservation initiatives and adapt to climate and biodiversity challenges is one of key areas of NBSAP.

8.2.2 Strategic Directions for Implementation:

By embedding local community participation and rights into biodiversity governance, Timor-Leste will uphold its commitments under the KMGBF (Targets 21–23), the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), and national social inclusion policies. This approach ensures that biodiversity conservation is not only ecologically sound but also socially just and culturally grounded. Therefore, the following strategic directions will be duly considered while implementing the NBSAP.

1. Institutionalize local community representation by recruiting poor, marginalized, and women-headed families in decision-making positions in biodiversity committees and working groups.
2. Formalize mechanisms for FPIC in biodiversity-related policies, projects, and Environmental Impact Assessments.
3. Document, safeguard, and promote traditional ecological knowledge through participatory mapping, biodiversity registers, and community-led monitoring.
4. Establish benefit-sharing frameworks that ensure local communities receive equitable returns from biodiversity conservation and ecosystem services.
5. Develop capacity-building programs and partnerships to support local community-led conservation, with a focus on youth, women, and intergenerational knowledge transfer.

9. CAPACITY DEVELOPMENT AND ENABLING CONDITIONS

To implement the NBSAP, several of the targets have actions where training and capacity-building is needed or could be provided in specific areas. The capacity-building plan outlined below addresses the needs of government staff and the public to understand better and implement the NBSAP and is also presented in **Annex 7**. In the case of government, to improve cross-sectoral implementation and policy changes, awareness-raising training on the NBSAP is needed. For the conservation and management agencies, the NBSAP seeks improvements in programme delivery and monitoring, and some training to staff would be beneficial.

9.1 Capacity Building in Conservation Departments

Success of NBSAP implementation and its long-term impact will depend on the continuous involvement of government and non-government organizations. Among them, the role of conservation departments is critical. Several of the planned actions will require specialized training of some government staff from conservation departments, primarily within MALFF and MTE. These are outlined below.

- **Species Conservation and Recovery Planning:** Targeted training should be provided to technical staff within conservation and forestry departments on the development and implementation of species recovery and action plans for endangered, threatened, and endemic species. This training should cover threat assessment, population monitoring, habitat management, *ex situ* and *in situ* conservation measures, stakeholder engagement, and alignment with IUCN Red List methodologies. Strengthening these skills will enable departments to translate biodiversity assessments into practical recovery actions.
- **Enforcement and Compliance Capacity:** Newly recruited enforcement staff require structured induction training covering environmental legislation, compliance procedures, investigation techniques, and inter-agency coordination. This should include practical training in patrol planning, evidence collection, reporting violations, and community engagement, to ensure consistent enforcement of protected area regulations, wildlife protection laws, and pollution controls.
- **Environmental Protection, Risk Management, and Emergency Response:** Specialized training should focus on environmental protection and pollution management, including environmental risk assessment, regulatory compliance, sustainability principles, and incident response. Training modules should cover oil spills, waste and chemical management, habitat damage, climate-related emergencies, and environmental impact mitigation, strengthening preparedness and cross-sector coordination during environmental incidents.

- **Community Engagement and Training of Trainers (ToT):** A ToT programme should be established to equip conservation officers, park rangers, and extension workers with facilitation, communication, and participatory planning skills. These trainers will work directly with local communities surrounding national parks and conservation areas to promote co-management, stewardship, conflict resolution, and sustainable livelihood practices linked to biodiversity protection.
- **Access and Benefit-Sharing (ABS) and Legal Awareness:** Continued technical training on ABS is required for relevant ministries, particularly MTE and MALFF, focusing on national ABS procedures, permit systems, compliance monitoring, and reporting under the Nagoya Protocol. In parallel, targeted awareness sessions should be delivered to parliamentarians and senior decision-makers to strengthen understanding of the legal, economic, and biodiversity implications of ABS and its role in national development and innovation.
- **Monitoring, Indicators, and NBSAP Reporting:** Dedicated training is needed on NBSAP monitoring and reporting, including the use of KMGBF headline indicators, component indicators, and nationally selected indicators. This should cover baseline setting, data collection methods, quality assurance, data management, inter-agency data sharing, and preparation of national and global reports (e.g., CBD National Reports). Strengthening these skills will improve evidence-based decision-making and accountability.
- **Leadership, Coordination, and NBSAP Governance:** Senior and mid-level officials across conservation-related institutions should receive training on strategic leadership, inter-ministerial coordination, results-based management, and adaptive governance. This includes understanding roles and responsibilities in NBSAP implementation, coordinating across sectors, mobilizing resources, and responding to emerging challenges.
- **Gender Equality, Disability, and Social Inclusion (GEDSI):** Mandatory sensitivity and capacity-building training on GEDSI should be provided across all relevant departments. This training should focus on inclusive planning, equitable participation, safeguarding, and monitoring of gender- and inclusion-related outcomes, ensuring that biodiversity policies and programmes benefit women, youth, PwD, and other disadvantaged groups.

9.2 Capacity Building in Non-conservation Ministries and Departments

Several key Ministries and Departments require capacity-building on the importance of biodiversity and on how their ministries can reduce impacts on biodiversity and incorporate biodiversity into their policies. These ministries include: the Ministry of Health, the Ministry of Trade and Industry, the Ministry of Education, the Ministry of Public Works, and the Ministry of State Administration. Training should focus on the relationships among biodiversity, ecosystem services, food supply, and human health and well-being, which are elaborated below.

- **High-Level Awareness for Policy and Decision Makers:** A structured, high-level presentation package will be developed on the value of biodiversity, conservation**,** and sustainable use, the role of Environmental Impact Assessment (EIA), and the objectives and implementation mechanisms of the NBSAP. These briefings will be tailored for senior officials and technical units within the MH, MALFF, MTE, MTI, MPW, MSA, MF, MPSI, MJ, SEI, and the Council of Ministers. The objective is to strengthen cross-sectoral understanding of biodiversity risks and opportunities, support informed policy decisions, and improve integration of biodiversity considerations into sectoral planning, infrastructure development, and investment decisions.
- **Biodiversity Education for Schools and Educators:** Age-appropriate educational materials should be developed for primary and secondary schools and universities, Fisheries Training Center in Maubara, National Institute of Public Service, and Centro de Formação Jurídica. The training may cover the value of biodiversity, conservation practices, sustainable consumption, pollution prevention, waste management, and the role of the NBSAP. These materials should align with national curricula and local contexts. In parallel, training-of-educators programmes should be delivered for senior teachers and curriculum developers to ensure accurate content delivery, practical classroom application, and long-term integration of biodiversity education into formal learning systems.
- **Specialized Training for Customs and Border Agencies:** Continuous and specialized training is required for the Timor-Leste Customs Department on pathways and risks associated with invasive alien species, as well as on national obligations under the Nagoya Protocol and the Cartagena Protocol on Biosafety. Training should focus on risk identification, inspection procedures, documentation requirements, inter-agency coordination, and reporting mechanisms, strengthening the country's ability to prevent biosecurity threats and comply with international biodiversity agreements.
- **Biodiversity and Human Health in Urban Planning:** Targeted training should be delivered to the Ministry of State Administration and the Ministry of Public Works on the linkages between urban biodiversity, green spaces, and human health. This training should highlight ecosystem services such as heat regulation, improved air and water quality, mental well-being, and disaster risk reduction, and demonstrate how nature-based solutions can be integrated into urban planning, public infrastructure, and municipal development processes.

9.3 Capacity Building for the Public

Some targets of this NBSAP require training for students (and teachers) to develop an understanding of the importance of biodiversity, reducing footprints, and the impacts of people. In contrast, other members of the public require continued efforts to raise awareness of the NBSAP and identify individual improvements to reduce the effects and maintain biodiversity.

- Community and local government capacity building for rights-based biodiversity governance and collective biodiversity management: Strengthening community capacity is central to

effective and equitable implementation of Timor-Leste's NBSAP. Building on the Government's existing extension programmes, community capacity building should move beyond a narrow "conservation" framing toward rights-based, people-centered biodiversity governance, consistent with KMGBF, CBD guidance, and Timor-Leste's Constitution (Article 61) and Environment Law (Lei de Bases do Meio Ambiente). This approach recognizes communities not only as beneficiaries but as rights-holders, stewards, and co-managers of biodiversity, ensuring procedural rights (access to information, participation, justice) and substantive rights (lands, territories, resources, culture) in biodiversity planning and management. The training can be in the following areas.

- Strengthen community capacity to establish, govern, and manage LMMAs and CFs, including decision-making structures, benefit-sharing arrangements, accountability mechanisms, and coordination with municipal authorities.
- Continue capacity building for communities managing national parks and conservation areas, with emphasis on visitor services, eco-tourism operations, cultural interpretation, and community-led conservation enterprises that generate local livelihoods.
- Enhance community understanding of the National Biodiversity Law/Decree, Wildlife Conservation Law, and related regulations, focusing on rights, responsibilities, access and benefit-sharing, and community roles in enforcement and compliance.
- Train communities in tree nursery establishment, seed collection, and nursery management to support restoration, reforestation, agroforestry, and landscape rehabilitation initiatives.
- Build skills in fisheries production standards, sustainable harvesting practices, aquaculture farm management, and sustainable seaweed collection, ensuring alignment with ecosystem-based management and food security objectives.
- Provide training on climate-resilient farming practices, soil conservation, agroecology, and water management to improve productivity while reducing pressure on biodiversity.
- Build community awareness and practical skills in circular economy approaches, waste reduction, recycling, plastic and hazardous waste management, and minimizing emissions and effluents to address key drivers of biodiversity loss.
- Strengthen community capacity for participatory resource monitoring and sampling of fisheries, wildlife, forests, and inland waters, particularly within LMMAs and CFs, to support adaptive management and national biodiversity monitoring systems.
- Enhance community-level enforcement capacities within LMMAs and CFs, including conflict resolution, reporting mechanisms, and collaboration with municipal and national enforcement agencies.
- Align capacity-building actions with Timor-Leste's decentralization policy by focusing on municipal-level implementation, using existing administrative structures and strengthening national and sub-national institutions capable of delivering training (e.g.

UNTL Centres, Fisheries Training Centre in Maubara, National Institute of Public Service, Centro de Formação Jurídica).

- Conduct a National Capacity Self-Assessment covering municipal-level stakeholders and non-conservation ministries to identify skills gaps for implementing biodiversity-related legislation, particularly in aquatic and agri-food systems, and to map state and non-state institutions able to deliver required training.
- Design training curricula that address not only technical skills but also leadership, accountability, local responsibility, and institutional coordination, helping shift legacy "exclusionary conservation" mindsets toward inclusive natural resource management approaches.
- Establish a dedicated programme to document, map, and monitor freshwater biodiversity linked to aquatic food systems, integrating biodiversity data with nutrition and food security policies. This includes promoting small endemic fish species, rice–fish systems, native species for mosquito control, and biodiversity-friendly aquaculture and agro-ecosystems.

- **Capacity building of educational institutes:** To educate school children on the importance of biodiversity and ecosystem services, the Department of Environment, together with the Ministry of Education, should develop a series of educational materials for students at both elementary and secondary levels that can be integrated into curricula. Schools and universities need to develop primary and secondary educational materials to raise awareness of biodiversity, consumption, recycling, and plastic pollution. Capacity-building of teachers is also essential to present conservation and biodiversity educational materials and deliver training.

- Capacity building for the private sector: Effective implementation of the NBSAP will require active engagement and strengthened capacity within the private sector, whose activities can have significant impacts on biodiversity but also offer major opportunities for conservation, restoration, and sustainable use. Targeted capacity-building will enable businesses to understand their biodiversity risks and responsibilities, adopt mitigation measures, and contribute positively to national biodiversity and development objectives. Some areas of capacity building are listed below.

  - Build the capacity of selected companies to identify, assess, and manage their impacts on biodiversity, including training on biodiversity risk assessment, mitigation hierarchies, monitoring, and reporting aligned with NBSAP objectives.
  - Strengthen private sector capacity to design and access biodiversity-friendly financing mechanisms, including green finance, blended finance, and public–private partnerships (PPPs), to mobilize investment for conservation, restoration, and nature-based solutions while ensuring financial viability and accountability.
  - Enhance skills and awareness in circular economy approaches, sustainable waste management, pollution reduction, and minimizing emissions and effluents, supporting

compliance with environmental standards and national goals on sustainable consumption and production.

- Provide guidance on integrating NbS into business operations and investments, enabling companies to use ecosystems such as forests, mangroves, reefs, and wetlands to manage climate risks, protect assets, and generate co-benefits for biodiversity and livelihoods.
- Build understanding of national environmental laws, regulations, and permitting requirements, including environmental impact assessment (EIA) processes, sector-specific standards, licensing, and reporting obligations, to reduce compliance risks and improve environmental performance.
- Train businesses in environmental risk screening, due diligence, and compliance monitoring to ensure biodiversity risks are identified early in project planning, mitigation measures are applied effectively, and performance is tracked and reported transparently.

10. Potential Environmental Impact and Mitigation Measures

Biodiversity conservation and environmental impacts are deeply interconnected, as actions taken to protect ecosystems and species can themselves generate environmental and social effects if not carefully planned and managed. In Timor-Leste, conservation interventions such as protected area management, restoration, infrastructure for eco-tourism, or livelihood support can alter land use, resource access, and ecosystem dynamics, potentially affecting habitats, water systems, and community well-being. Equally, weak environmental management within conservation activities can undermine the very biodiversity outcomes they aim to achieve. This interdependence makes it essential that biodiversity conservation and environmental protection are addressed together through a precautionary, integrated approach.

It is essential to have a system in place that anticipates and manages potential risks, including environmental degradation, social exclusion, displacement and resettlement, or conflicts over natural resources, that may emerge during implementation. Applying environmental and social safeguard measures is necessary while implementing NBSAP to ensure that conservation and management actions avoid or minimize adverse environmental impacts, respect community rights and livelihoods, and maintain ecological integrity, so that efforts to conserve biodiversity do not create new environmental or social risks but instead deliver sustainable, inclusive, and lasting benefits for Timor-Leste, thus aligning with DO NO HARM principle. Safeguarding risks also ensure that biodiversity actions uphold social inclusion, gender equality, human rights, and environmental integrity, in line with national regulations and international safeguard standards.

It is necessary to develop Environmental and Social Safeguard Framework (ESSF) to: i) Identify, assess, and manage potential environmental and social risks associated with implementing the NBSAP across all sectors and activities; ii) Ensure compliance with Timor-Leste's national laws, environmental policies, and international safeguard standards, including those of CBD, UNDP, and other development partners, and iii) Promote inclusive, sustainable, and conflict-sensitive biodiversity management, ensuring that interventions respect community rights, cultural values, and gender equality while minimizing unintended negative impacts.

The ESSF applies to all NBSAP interventions across key sectors, including forestry, agriculture, fisheries, tourism, land-use planning, and community development. It will provide a national framework with a focus on priority ecosystems, including Atauro Island, Nino Konis Santana National Park, the southern coastal ecosystems, and the Aileu Highlands, which are areas of high ecological and socio-economic significance. The framework will guide the assessment and

management of risks throughout the NBSAP implementation period (2026–2030). The ESSF ensures that it reflects national priorities, international safeguard standards, and local realities.

10.1 Policies Relevant for Environmental and Social Risk Mitigation

Timor-Leste has established a comprehensive national-level legal and policy foundation to ensure environmental protection, biodiversity conservation, and social inclusion. For instance, Environmental Licensing Decree Law No. 5/2011 provides the legal basis for environmental impact assessment (EIA), requiring all development projects to evaluate and mitigate potential environmental and social impacts before implementation. The Environmental Framework Law (2012) establishes the overarching principles for sustainable ecological management, requiring the integration of environmental considerations into all sectoral policies and development planning.

Land and Property Law (2017) regulates land tenure, ownership, and use, emphasizing fair and transparent land management to avoid social conflicts and safeguard community rights. National Gender Equality Policy (2017–2030) promotes gender-responsive planning, ensuring women's participation and leadership across environmental and biodiversity sectors. National Adaptation Plan (2021) outlines priorities for building climate resilience through ecosystem-based adaptation and community-driven interventions that integrate biodiversity and social inclusion.

The country's environmental and social safeguards are also grounded in its obligations under key international conventions and frameworks. For instance, the CBD guides the protection and sustainable use of biodiversity and the equitable sharing of benefits from genetic resources. UNFCCC supports national efforts to address climate risks through adaptation, mitigation, and measures that enhance ecosystem resilience. The UNCCD promotes sustainable land management and restoration of degraded ecosystems. The UNDP Social and Environmental Standards (SES) ensure that all UNDP-supported projects prevent harm to people and the environment and promote inclusivity and sustainability. The FAO Voluntary Guidelines on Tenure and Indigenous Peoples' Rights (VGGT) provide principles for equitable land governance and the protection of Indigenous and community tenure rights, which are critical for biodiversity and social equity.

10.2 Environmental and Social Risks and Safeguards

A risk screening was undertaken to identify and assess potential environmental and social risks associated with the implementation of the NBSAP in Timor-Leste. First, strategies to strengthen social and environmental sustainability are described under four overarching principles: Leave No One Behind (LNOB), Do No Harm, human rights, gender equality and women

empowerment, and accountability (**Table 16**), following the UNDP Social and Environmental Standards (SES) screening checklist. The checklist considers the following eight standards: biodiversity conservation and sustainable NRM, climate change and disaster risks, community health, safety, and security, cultural heritage, displacement and resettlement, indigenous peoples, labor and working conditions, and pollution prevention and resource efficiency. A separate section on GEDSI (Section 8.1) has been prepared for the NBSAP to address these issues.

Table 16. Strategy to integrate various strategies for strengthening social and environmental sustainability

How does the government ensure integration of LNOB, right-based approach, gender equality, women's empowerment, sustainability, resilience and accountability of stakeholders strengthen social and environmental sustainability?
Describe how government ensures Leave No One Behind (LNOB) in NBSAP implementation
The Government of Timor-Leste ensures LNOB by prioritizing inclusive participation of vulnerable and marginalized groups, including women, youth, PwD, local communities, subsistence farmers, and remote rural households in all NBSAP consultations and decision-making processes. The NBSAP aspires that biodiversity actions benefit underserved groups by improving livelihood opportunities, strengthening access to natural resources, and reducing exposure to environmental risks. Implementation will be guided by disaggregated data, culturally appropriate engagement, and municipal-level consultations to ensure no community or social group is excluded from biodiversity benefits or decision-making. MTE will ensure this by appropriately engaging other stakeholders and monitoring the impact of NBSAP on the ground level.
Describe how the NBSAP mainstreams the human rights-based approach
The NBSAP adopts a human right–based and Do No Harm approaches by ensuring that biodiversity policies respect constitutional environmental rights and the rights of communities to participate in, access information about, and benefit from sustainable natural resource management. The government will promote FPIC where community rights or traditional lands are concerned, integrates *tara bandu* and community stewardship systems, and safeguards environmental human rights defenders. The government will also emphasize transparency, accountability, gender equity, and access to grievance and redress mechanisms.
Describe how the NBSAP is likely to improve gender equality and women's empowerment
The NBSAP aims to strengthen gender equality by explicitly recognizing women's roles in agriculture, forestry, fisheries, and natural resource management, and by removing barriers to their participation in planning, leadership, training, and benefit-sharing. Activities will promote women's access to land, information, finance, climate-smart technologies, and economic opportunities in biodiversity-related livelihoods (e.g., agroforestry, ecotourism, mangrove restoration) as outlined in Annex 7. Gender-responsive indicators and data disaggregated by sex during the implementation will guide implementation, ensuring women's voices, leadership, and benefits are central to NBSAP outcomes.
Describe how the NBSAP strengthens accountability to stakeholders
The NBSAP reinforces accountability through clear institutional roles, transparent monitoring and reporting mechanisms, and regular dialogue between government, civil society, academia, private sector, and local communities. The Technical Working Group (TWG) and sectoral ministries will report progress using agreed indicators and share results publicly through government websites, municipal consultations, and national reporting to the CBD. Multi-stakeholder oversight, including NGOs, community leaders, youth networks, and women's organizations, ensures independent feedback and supports continuous improvement.
Describe how the NBSAP mainstreams sustainability and resilience
The NBSAP mainstreams sustainability by promoting ecosystem-based management, climate-resilient

agriculture, sustainable forestry, community-led marine management, and restoration of degraded landscapes. Actions focus on enhancing ecosystem services, reducing vulnerability to climate hazards, diversifying livelihoods, and conserving biodiversity as a foundation for long-term social and economic development. Nature-based solutions—including mangrove restoration, watershed rehabilitation, LMMAs, and sustainable land management—strengthen resilience while supporting carbon mitigation, food security, and disaster risk reduction.

Environmental Safeguards: To ensure that biodiversity actions in Timor-Leste are environmentally sound and sustainable, the NBSAP document incorporates a robust set of environmental safeguards. The government will ensure minimization of adverse environmental impacts, enhance ecosystem resilience, and ensure that conservation and development activities contribute positively to national sustainability goals while implementing the NBSAP. Key measures include habitat protection, restoration, and pollution prevention in all biodiversity and land-use projects. Activities will avoid ecologically sensitive areas, rehabilitate degraded lands, restore mangroves and forests, and promote sustainable waste and chemical management. Biodiversity screening for major infrastructure and private-sector projects will be made mandatory before their approval, and it will be embedded in appropriate sectoral policies and plans.

The plan also encourages climate risk screening, ecosystem-based adaptation (EbA), and NbS to address climate threats, such as droughts, floods, and coastal erosion, through reforestation, watershed restoration, and sustainable agricultural practices. Furthermore, environmental licensing and monitoring, as mandated by Decree Law No. 5/2011, will be enforced, with regular Environmental Impact Assessments (EIAs) and project-level tracking to detect and address environmental risks early. Integration will be done with NDC, NAP, and Article 6 Carbon Market Readiness where NbS, forest restoration as carbon mitigation, and readiness mechanisms are prioritized.

Social Safeguards: The social safeguard measures will be duly considered during implementation of the NBSAP. They are designed to promote equity, inclusion, and respect for human rights in biodiversity management. The government will ensure that the benefits of conservation and sustainable resource use are shared fairly among all groups, and that potential social risks are effectively mitigated. Central to these measures is the mainstreaming of GEDSI principles across all NBSAP targets and activities.

IMPACT							
	Critical	5	High	High	High	High	High
	Severe	4	Medium	Medium	High	High	High
	Moderate	3	Low	Medium	Medium	Medium	Medium
	Minor	2	Low	Low	Medium	Medium	Medium
	Negligible	1	Low	Low	Low	Low	Low
			1	2	3	4	5
			Slight	Not Likely	Moderately Likely	Highly Likely	Expected
			PROBABILITY				

Figure 17. Risk screening framework

The NBSAP emphasizes the inclusive participation of local communities, who hold vital ecological knowledge, ensuring that biodiversity initiatives are culturally appropriate and locally led. A GRM will be established at the national and municipal levels to address complaints transparently and promptly. This, along with records and reports of grievances and resolutions, will be accessible to local communities, women, youth, and PwD. It will be linked to EIA process, while FPIC will be duly considered. Additionally, the NBSAP commits to conflict-sensitive implementation and fair compensation, particularly where access to resources may be restricted, thereby protecting livelihoods and promoting trust. Together, these social safeguards uphold fairness, participation, and accountability, ensuring that biodiversity conservation delivers benefits for both people and nature. Wherever appropriate, the implementation of NBSAP will consider "One Health: mechanisms to reduce the risk of zoonotic disease risks, vector-borne diseases, and water-borne disease risks caused by degraded watershed on fish and livestock.

Risks were analyzed for each NBSAP action based on magnitude, likelihood, reversibility, and stakeholder sensitivity, and classified into four categories: Low, Moderate, Substantial, and High. This assessment identified site-specific vulnerabilities, institutional challenges, and social sensitivities that could arise during NBSAP implementation. The risks, along with relevant actions and mitigation measures under each standard, are summarized in **Table 17**. Through this structured screening, the NBSAP ensures that all biodiversity interventions integrate environmental and social safeguards from the outset.

Table 17. Potential Environmental and Social Impacts and Mitigation Measures

Risk Issues	Risk Category	Probability, Impact & Rating	Indicators / Unmitigated Impact	Mitigation Measures
Climate Change	Environmental – Climate Risk	Prob: 1 Impact: 2 Risk: Low	Greater exposure of project sites to flooding, landslides, drought, coastal erosion	Incorporate climate-resilient design; avoid high-risk sites; promote nature-based solutions (mangrove restoration, watershed protection)
Flora and Fauna (Habitat loss, degradation, fragmentation)	Biodiversity & Ecosystems	Prob: 1 Impact: 1 Risk: Low	Disturbance to fauna; loss of vegetation; sensitive habitat degradation	Avoid illegal entry to protected areas; no clearing of primary forest; conduct ecological screening; implement replanting/restoration
Pollution	Environmental Pollution	Prob: 1 Impact: 2 Risk: Low	Waste accumulation; soil/water contamination; plastic pollution	Enforce waste management protocols; recycling; restrict chemical use; safe storage and disposal
Overexploitation of living natural resources	Natural Resource Use	Prob: 2 Impact: 2 Risk: Medium	Unsustainable harvesting of timber, fuelwood, fisheries; depletion of NTFPs	Promote sustainable harvesting; community monitoring; strengthen tara bandu; co-management rules
Invasive alien species	IAS Risk	Prob: 1 Impact: 2 Risk: Low	Spread of non-native species; loss of native biodiversity and productivity	Prevent introduction of non-native species; early detection; native species restoration
Hydrological changes	Water Resources	Prob: 1 Impact: 2 Risk: Low	Altered water flow; erosion; sedimentation affecting rivers, agriculture, wetlands	Avoid interventions in sensitive waterways; soil and water conservation; riparian buffer restoration
Land acquisition and resettlement	Social – Land & Tenure	Prob: 1 Impact: 2 Risk: Low	Land disputes; restricted access to land and natural resources; risk of community conflict	No land acquisition required; voluntary land-use agreements; ensure FPIC for all local community lands; document agreements; accessible grievance redress mechanism
Community health and safety	Social – Health & Safety	Prob: 1 Impact: 2 Risk: Low	Injury risks from project activities, equipment handling, vehicle movement; exposure to hazards	Apply OHS standards; provide PPE; training for workers and communities; emergency preparedness plan; signage and awareness campaigns
Cultural heritage and historical sites	Cultural Heritage	Prob: 1 Impact: 2 Risk: Low	Disturbance to sacred sites, traditional areas, or archaeological	Conduct cultural screening; avoid heritage sites; engage traditional

			features; risk of chance finds	leaders; implement chance-find procedure; respect *tara bandu* and customary rules
Stakeholder engagement	Governance / Participation	Prob: 2 Impact: 2 Risk: Medium	Exclusion of vulnerable groups; communication gaps; mistrust; delayed project activities	Implement inclusive stakeholder engagement plan; multilingual consultations; continuous information-sharing; ensure participation of women, youth, PWDs; functional grievance mechanism
Impact on local communities	Local Community Rights & Social Inclusion	Prob: 1 Impact: 2 Risk: Low	Undermining customary practices; reduced access to natural resources; unequal benefit-sharing	Ensure FPIC; co-design activities with local communities; benefit-sharing arrangements; integrate traditional governance systems (*tara bandu*); support cultural protection and gender-inclusive participation

10.3 Stakeholder Engagement in Managing Risks

The effective implementation of environmental and social safeguards under NBSAP depends on the active engagement and coordination among national institutions, local governments, and communities. Several institutions share responsibility for implementing and monitoring environmental and social safeguards under the NBSAP framework. Each institution plays a complementary role in identifying, mitigating, and monitoring risks to ensure that biodiversity conservation efforts are environmentally sustainable and socially equitable.

Ministry of Tourism and Environment (MTE): As the lead coordinating agency, MTE will provide overall leadership in implementing the NBSAP and ensuring compliance with environmental and social safeguards. It will be responsible for coordinating policy formulation and strategic planning for biodiversity and ecosystem management; overseeing the integration of environmental impact screening and restoration guidelines into all NBSAP activities to address risks such as ecosystem degradation, pollution, and habitat loss; leading national-level monitoring and reporting on safeguard performance, including environmental licensing (as per Decree Law No. 5/2011); and ensuring alignment with international environmental conventions (CBD, UNFCCC, UNCCD) and donor safeguard requirements (e.g., UNDP SES, GEF).

Ministry of Agriculture, Livestock, Forestry and Fisheries (MALFF): MALFF will play a critical role in managing the agriculture–forestry–fisheries nexus, which directly influences biodiversity outcomes. Its responsibilities include: integrating biodiversity conservation and ecosystem restoration practices within agricultural and fisheries production systems; implementing

measures to prevent land degradation, deforestation, and chemical pollution through the promotion of organic agriculture, agroforestry, and sustainable fisheries management; conducting participatory land-use planning and clarifying tenure rights to minimize land and resource conflicts; and monitoring ecosystem health and applying conservation offsets in areas affected by development activities.

Ministry of Social Solidarity and Inclusion (MSSI): MSSI will ensure that the NBSAP implementation upholds social safeguards, particularly those related to GEDSI. Its role will focus on: ensuring the equitable participation of women, youth, Indigenous Peoples, and vulnerable groups in decision-making, training, and benefit-sharing activities; leading the development of gender-responsive indicators and ensuring the inclusion of social safeguard measures in biodiversity-related programs; supporting community outreach and awareness on social inclusion, rights-based conservation, and livelihood diversification; overseeing the implementation of the GRM to ensure transparency and conflict-sensitive management of complaints.

National Environment Directorate and Municipal Governments: At the operational level, the National Environment Directorate and Municipal Governments will ensure that environmental and social safeguards are effectively enforced and monitored within local jurisdictions. Their roles include: conducting local-level ecological monitoring to identify and address emerging risks, such as pollution, habitat loss, or illegal resource use; facilitating community participation and FPIC in conservation planning, especially where land and resource rights are affected; coordinating awareness programs and community training on restoration, waste management, and sustainable resource practices; and supporting the documentation and protection of Indigenous knowledge and cultural heritage in biodiversity management.

11. FINANCIAL PLANNING

11.1 Overview and Rationale

Timor-Leste's success in implementing the NBSAP will depend on its ability to mobilize adequate and sustained financial resources. As a small island developing state (SIDS), the country faces numerous competing development priorities, including healthcare, education, infrastructure, waste management, and employment generation. Being a Least Developed Country (LDC), Timor-Leste also has limited institutional capacity, high vulnerability to climate change, and disproportionate conservation burdens. Consequently, biodiversity conservation has often received limited domestic funding.

To address this gap, biodiversity finance must adopt a blended approach that combines domestic public investments, international assistance, and innovative financing mechanisms, including environmental taxes, biodiversity credits, payment for ecosystem services (PES), and climate-linked finance. Government agencies, NGOs, and community representatives widely recognize that achieving NBSAP targets will only be possible through strategic partnerships with GEF, GCF, ODA, bilateral donors, and multilateral development banks. At the same time, strengthening national systems such as the Biodiversity Finance Initiative (BioFIN), an ongoing initiative, will help enhance domestic financial ownership, ensure accountability, and mainstream biodiversity into fiscal planning. The BioFIN will prepare a detailed analysis and strategy for financing the implementation of NBSAPs. This document highlights key issues to consider when securing and managing funds for NBSAP implementation.

11.2 Laying the Foundation for Biodiversity Finance

This section aligns with the UNDP BIOFIN Workbook (2024), which provides a standardized and internationally recognized methodology for assessing biodiversity finance, identifying financing gaps, and developing practical finance solutions to support NBSAP implementation. This follows the BIOFIN framework, ensuring consistency with global good practice while being tailored to Timor-Leste's national policy context, public finance systems, and biodiversity priorities.

Step 1: Policy and Institutional Review (PIR)

During the implementation of the NBSAP, a comprehensive Policy and Institutional Review will be undertaken to assess how existing national policies, laws, strategies, and institutional arrangements influence biodiversity conservation and financing in Timor-Leste. This review will examine sectoral policies in environment, agriculture, fisheries, infrastructure, energy, tourism, and public finance to identify areas of alignment, gaps, overlaps, and inconsistencies with biodiversity objectives. It will also clarify institutional mandates, coordination mechanisms, and roles across national and municipal levels. The findings of this review will inform policy reforms

and institutional strengthening measures, which will be further detailed in the Biodiversity Finance Plan currently under preparation.

Step 2: Biodiversity Expenditure Review (BER)

As part of NBSAP implementation, a Biodiversity Expenditure Review will be conducted to establish a clear baseline of existing biodiversity-related spending. This review will compile and analyze data on government budget allocations across biodiversity-relevant ministries, donor- and UN-funded projects, climate finance linked to Nature-based Solutions, and investments by NGOs and the private sector. Expenditures will be classified according to their relevance to biodiversity conservation and sustainable use. The results will help identify funding trends, gaps, inefficiencies, and opportunities for improved allocation of resources, and will directly inform the development of the Biodiversity Finance Plan.

Step 3: Biodiversity Financial Needs Assessment (FNA)

A Biodiversity Financial Needs Assessment will be carried out to estimate the financial resources required to implement priority actions under the NBSAP over the 2026–2030 period. This assessment will cost actions related to ecosystem protection, species conservation, restoration, governance, monitoring, and capacity development, taking into account Timor-Leste's fiscal constraints. A phased and prioritized approach will be applied, considering ecological urgency, socioeconomic benefits, particularly for local communities, and potential for co-financing. The assessment will identify the biodiversity finance gap by comparing estimated needs with current and projected expenditures, with detailed results presented in the Biodiversity Finance Plan.

Step 4: Implementation of the Biodiversity Finance Plan (BFP)

The Biodiversity Finance Plan will provide a structured framework for implementing identified finance solutions during the NBSAP period. It will define roles and responsibilities of key institutions, establish timelines, identify funding sources, and outline coordination mechanisms among national and municipal authorities, the private sector, civil society, and development partners. Integration with existing public finance management and budgeting systems will be emphasized to ensure sustainability and national ownership. Implementation arrangements and institutional responsibilities will be further detailed in the finalized Biodiversity Finance Plan.

In addition to the above-mentioned actions, monitoring and reporting mechanisms will be established to track biodiversity-related financial flows, assess progress toward closing the finance gap, and support adaptive management throughout NBSAP implementation. Biodiversity finance indicators will be integrated into the NBSAP Monitoring and Evaluation framework and linked to national reporting processes. A centralized system for tracking biodiversity expenditures will be developed in coordination with the Ministry of Finance and relevant institutions. Regular reporting will inform policy adjustments, financing decisions, and engagement with development partners, ensuring that biodiversity finance remains transparent, effective, and responsive to emerging priorities.

11.3 Potential Funding Sources and Financing Strategies

Timor-Leste's biodiversity financing strategy should combine ongoing and emerging funding sources, as well as innovative financial tools, to ensure long-term sustainability.

11.3.1. Direct Domestic Fund Allocation

Timor-Leste can enhance the long-term financial sustainability of its biodiversity programs by leveraging domestic funding sources in conjunction with international assistance. One of the most viable options is to allocate a defined portion of the Petroleum Fund, the country's central sovereign wealth reserve, to environmental sustainability and biodiversity conservation. A fixed percentage of annual petroleum revenues could be earmarked for activities such as reforestation, watershed rehabilitation, mangrove and coral reef restoration, and coastal protection.

To complement this approach, the government could establish a dedicated Biodiversity Conservation Fund under MTE. This fund would serve as a centralized mechanism for channeling both domestic and international resources toward the implementation of NBSAP. It could pool contributions from national revenue allocations, private sector CSR initiatives, tourism levies, and donor co-financing. The fund should operate under transparent governance and reporting structures, ensuring accountability and effective tracking of biodiversity expenditures.

11.3.2. Fiscal Policy and Regulatory Reform

Timor-Leste can increase domestic biodiversity funding through fiscal reforms and incentive-based mechanisms, such as:

- **Environmental taxes and levies:** The government can impose a non-refundable tax on products that are harmful to the environment such as pollutants (e.g., plastic bottles, rubber tires, chemical fertilizers, and insecticides. A certain proportion of the income can be allocated to the Biodiversity Conservation Fund.
- **Tourism and environmental levies:** The government can expand the Atauro Island model nationally by introducing a small environmental fee or tourist tax for all tourists entering the country. The funds collected can be directed to protected area management and community-based ecotourism initiatives. This tax would be over and above entry fees to Parks or other protected areas and could be added to the cost of a tourist visa. There is much global precedent for such a fee. Jordan, for example, requires a "Jordan Pass" for all foreign tourists; the EU instituted a fee for all tourists in 2022, as did New Zealand, Japan, and the USA, as well as many individual cities, such as Barcelona and Toronto.

- **Biodiversity credit and compensation systems:** It is essential to explore participation in the Biodiversity Credit Alliance to establish a voluntary biodiversity credit market in line with international best practices. Creating a damage remediation system to collect fines for environmental violations (e.g., illegal logging, EIA breaches, overfishing) can also generate funds that can be dedicated to restoration.
- **Subsidy reform and positive incentives:** Implementing a "no net harm" subsidy policy that requires all future subsidies to undergo biodiversity impact assessments can also discourage harmful subsidies, thereby eliminating adverse effects. The government can develop a policy under this NBSAP requiring an assessment of any proposed new subsidy for its potential harmful impacts, prior to implementation. Potential subsidies can be redirected toward sustainable agriculture, community forestry, and ecosystem restoration, consistent with KMGBF Target 18. Timor-Lest Petroleum Fund could be one source of funding.

Activities related to subsidy reform and positive incentives are included under Target 18 (Actions 18.1, 18.2, and 18.3). To make the subsidy and incentives initiatives effective, the following key actions are important: 1) Review biodiversity-harmful subsidies, 2) Reform policies and regulations, 3) Redirect subsidies to positive incentives, 4) Apply economic instruments and accountability measures, 5) Strengthen institutional capacity and coordination, and 6) Monitor and report progress. An Action Plan for reducing harmful subsidies and promoting positive incentives is also presented to reduce harmful subsidies and promote

The Action Plan outlines a phased and practical approach to reforming subsidies and incentives so that public finance supports, rather than undermines, biodiversity conservation. It begins with a national review of subsidies, incentives, and public expenditures in key sectors to identify those that place pressure on ecosystems. Based on this evidence, policies and regulations will be revised to remove or reform harmful incentives, strengthen biodiversity safeguards, and improve coordination between fiscal and environmental frameworks. At the same time, financial resources will be progressively redirected toward positive incentives that support sustainable agriculture and fisheries, NbS, ecosystem restoration, protected areas, and community-based conservation, with particular attention to women, youth, and vulnerable groups.

To ensure effectiveness and accountability, the Action Plan also includes measures to strengthen economic instruments, institutional capacity, and coordination across government. Monitoring and reporting mechanisms will be integrated into the NBSAP M&E system to track subsidy reforms, measure financial shifts toward biodiversity-positive investments, and report progress through national budgets and biodiversity reporting processes. The actions along with its alignment with BIOFIN, timeline, and responsible organizations are presented in **Table 18**.

Table 18. Key actions, timeline and responsible organization

Action	Key Activities	BIOFIN Alignment	Timeline	Lead & Supporting Institutions
1. Review biodiversity-harmful subsidies	· Compile an inventory of all relevant subsidies, incentives, and public expenditure programmes across key sectors. · Assess the direct and indirect impacts of these subsidies on forests, coastal and marine ecosystems, freshwater systems, and wildlife. · Integrate basic biodiversity screening questions into annual budget preparation and public investment planning processes. · Align the review with the BIOFIN Policy and Expenditure Review (PER) methodology and ongoing public finance reforms led by the Ministry of Finance. · Share findings with relevant ministries to support evidence-based decision-making.	BIOFIN Policy & Institutional Review (PIR)	Short-term (2026–2027)	MoF (Lead), MTE/DGE, MALFF, ANLA, UNDP BIOFIN
2. Reform policies and regulations	· Review sectoral incentive schemes in infrastructure, agriculture, fisheries, forestry, energy, and tourism to identify areas needing reform. · Introduce biodiversity safeguards and environmental conditions into subsidy and incentive schemes. · Strengthen coordination between fiscal policy reforms and environmental regulations. · Enhance the role of ANLA in environmental licensing by explicitly addressing subsidy- and incentive-driven biodiversity risks. · Ensure revised policies are consistent with NBSAP targets, environmental laws, and international commitments.	BIOFIN Policy Reform	Medium-term (2027–2028)	MoF, MTE/DGE, ANLA, MALFF
3. Redirect subsidies to positive incentives	· Increase financial support for sustainable agriculture, agroforestry, and environmentally responsible fisheries. · Invest in Nature-based Solutions (NbS),	BIOFIN Finance Solutions	Medium-term (2027–2029)	MoF, MTE, MALFF, Municipalities

	ecosystem restoration, and effective management of protected areas. · Strengthen community-based conservation approaches, including LMMAs, community forests, and Tara Bandu systems. · Promote women-led and community-led green livelihoods such as ecotourism, sustainable aquaculture, and non-timber forest products. · Ensure redirected incentives are accessible to local communities, women, youth, and vulnerable groups.			
4. Apply economic instruments and accountability measures	· Apply polluter-pays and user-pays principles where legally and technically feasible. · Strengthen fines, fees, or charges for activities that damage biodiversity, where appropriate. · Improve transparency by publicly reporting subsidy allocation and reform decisions. · Ensure accountability mechanisms are clear and understandable to stakeholders and communities. · Link economic instruments with enforcement and monitoring systems to ensure effectiveness.	BIOFIN Finance Reform	Medium-term (2028–2029)	MoF, ANLA, MTE
5. Strengthen institutional capacity and coordination	· Provide training on biodiversity-responsive budgeting and subsidy assessment for staff of MoF, MTE/DGE, MALFF, ANLA, and municipal administrations. · Establish an inter-ministerial coordination mechanism on biodiversity finance and subsidy reform. · Promote regular information sharing between finance, environment, and sector ministries. · Strengthen technical capacity to assess social, gender, and biodiversity impacts of subsidy reforms. · Ensure municipal governments are included, as many biodiversity impacts occur at the local level.	BIOFIN Capacity Development	Short–Medium (2026–2028)	MoF, MTE, UNDP BIOFIN
6. Monitor and report	· Integrate subsidy reform indicators into the NBSAP Monitoring and Evaluation	BIOFIN Monitoring &	Ongoing (2026–	MTE/DGE, MoF

progress	framework. · Track the number, type, and estimated value of harmful subsidies that are reformed or phased out. · Monitor the amount of finance redirected toward biodiversity-positive incentives. · Report progress through national biodiversity reports, budget documents, and CBD reporting mechanisms. · Make summary information publicly available to build trust and accountability.	Reporting	2030)	

11.3.3. Funding from Donor and Funding Partners

To ensure the long-term implementation of the NBSAP, Timor-Leste must continue to leverage both traditional and innovative financing mechanisms to diversify funding sources and reduce its dependency on short-term project grants. First, Multilateral mechanisms, such as GEF, GCF, AF the World Bank, and ADB, remain the primary sources of large-scale financing for biodiversity, climate adaptation, and ecosystem-based management. These institutions can support integrated projects linking biodiversity conservation with climate resilience, sustainable agriculture, and community livelihoods. Timor-Leste can benefit from the GEF-9 Biodiversity Focal Area, GCF readiness programs, and ADB's Nature-Positive Investment Framework to fund restoration and NbS.

Bilateral partnerships with countries such as Australia, Japan, New Zealand, the United States, and European Union are essential for technical cooperation, research, and small-grant programs. These partners have a long history of supporting environmental governance, marine protection, transboundary conservation, and rural livelihoods in the Pacific. Expanding bilateral collaboration can fund critical components of the NBSAP, including capacity building, spatial planning, ecosystem monitoring, and policy reforms. Regional organizations such as the Secretariat of the Pacific Regional Environment Programme (SPREP), Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), and the Association of Southeast Asian Nations (ASEAN) provide technical platforms for knowledge sharing, policy harmonization, and co-financing of transboundary conservation initiatives.

International private foundations, such as the Pew Charitable Trusts, the Packard Foundation, the Bill & Melinda Gates Foundation, and WWF's Eco-Corridors Fund, offer grants that support innovation, scientific research, and community-based conservation. Engagement with these foundations can enhance biodiversity communication, pilot community-driven initiatives, and support long-term sustainability models for local enterprises and protected area management.

Timor-Leste can also explore market-based and innovative finance mechanisms such as carbon markets, blue bonds, biodiversity credits, and green investment funds. Carbon markets can

reward communities for ecosystem restoration and mangrove conservation, while blue bonds can mobilize capital for sustainable fisheries and marine protection. Establishing an enabling legal and institutional framework is key to attracting investors and ensuring social and environmental safeguards. Collaboration with UN agencies, regional universities, and international research institutions will be crucial for strengthening project design, monitoring frameworks, and data-driven decision-making. Partnerships focused on remote sensing, ecosystem accounting, and spatial planning can enhance the quality and bankability of biodiversity projects.

11.3.4. Mobilizing Private Sector Investment

Timor-Leste's financial sector presents untapped opportunities for biodiversity-positive investment. For instance, banks can play a transformative role by developing green lending portfolios that prioritize environmentally sustainable and biodiversity-friendly enterprises and projects. Integrating biodiversity risk screening into loan assessments would help ensure that financing decisions account for ecological impacts, thereby reducing the risk of habitat loss and supporting sustainable resource use. Similarly, insurance companies can promote sustainability by designing products that reward climate-smart and eco-friendly practices.

Furthermore, all large-scale projects seeking government assistance, subsidies, or loans should be required to demonstrate full compliance with Environmental Impact Assessment (EIA) requirements, with biodiversity becoming the key component of the assessment. Public–Private Partnerships (PPPs) should be promoted in high-potential sectors, such as ecotourism, restoration, and sustainable aquaculture, where shared investments can deliver both economic and environmental benefits. PPPs can provide communities with alternative livelihoods while attracting private investment into biodiversity conservation and ecosystem restoration initiatives.

The private sector can play an essential role in financing the NBSAP through Corporate Social Responsibility (CSR) initiatives. Private companies can be encouraged to channel a portion of their CSR budgets toward biodiversity conservation and community-based environmental programs. This could include supporting mangrove and watershed restoration, sponsoring biodiversity education campaigns, investing in eco-tourism infrastructure, or funding efforts to manage waste and reduce pollution and improve coral reef monitoring or community-led marine protection. The government can strengthen this mechanism by developing clear CSR guidelines and incentives that align corporate contributions with the NBSAP targets and KMGBF.

11.3.5. Community-based Financing for Biodiversity Conservation

Local communities in Timor-Leste can play a pivotal role in generating and managing financial resources for biodiversity conservation through innovative, livelihood-based mechanisms that both enhance local income and sustain ecosystem services. Several opportunities exist to mobilize locally generated biodiversity finance:

Ecotourism and Nature-based Tourism: Community-managed ecotourism initiatives, such as guided forest treks, boating, diving, snorkeling, mangrove and coral reef tours, homestays, birdwatching, and cultural tourism, can directly generate revenue for biodiversity conservation. Entrance fees, tour charges, or community-managed conservation fees can be reinvested into habitat protection, waste management, and local conservation education. Examples such as Atauro Island's community-based marine tourism demonstrate the potential for tourism to sustain both livelihoods and biodiversity. Fees can also be collected for guided reef exploration, equipment rental, or eco-cruises.

Community Forest Management and Agroforestry: Sustainably managed community forests and agroforestry systems can produce both environmental and economic benefits. Through participatory forest management agreements, communities can harvest timber and non-timber resources responsibly, sell high-value crops (e.g., coffee, sandalwood, bamboo), and allocate part of the revenues to forest monitoring, replanting, and fire control. Such models also help reduce pressure on natural forests and enhance carbon sequestration.

Protected Area (PA) Co-management: Communities co-managing protected areas can collect and retain a share of park entrance fees, eco-lodge revenues, and visitor permits. Establishing community conservation funds under the management of PA boards can ensure revenue transparency and direct reinvestment in local livelihood activities, biodiversity monitoring, and infrastructure maintenance.

Enterprise and Entrepreneurship Development: Communities can diversify income by producing and marketing eco-friendly handicrafts derived from non-timber forest products (NTFPs), bamboo, palm leaves, or recycled materials. Certification and branding can attract tourism markets and generate added value. Income from these enterprises can fund forest restoration or biodiversity awareness campaigns. Encouraging small green enterprises, such as organic farming, honey production, herbal products, aquaculture, and nature-based hospitality, can create circular economies that benefit both biodiversity and local livelihoods. Capacity-building programs in business development, marketing, and financial literacy are crucial for supporting entrepreneurship among women and youth.

Carbon Credit and Climate Financing: Communities engaged in reforestation, mangrove restoration, and sustainable land management can participate in carbon credit schemes under voluntary or compliance markets (e.g., through the Verified Carbon Standard, Plan Vivo, or Gold Standard). Revenues from carbon credits can finance long-term forest protection, monitoring, and diversification of livelihoods.

Biodiversity Credit and Ecosystem Service Payments: Timor-Leste could pilot a biodiversity credit system or Payment for Ecosystem Services (PES) schemes in which communities receive compensation for maintaining or restoring ecosystems that provide essential services, such as water purification, pollination, or soil stabilization. These credits can be sold to corporations or funding partners seeking to offset their ecological footprint.

Innovation and Green Entrepreneurship: Supporting eco-innovation hubs and incubators can promote start-ups focusing on renewable energy, waste recycling, sustainable fisheries, and biodiversity-friendly technologies. Partnerships with universities, NGOs, and private investors can provide seed funding, mentorship, and opportunities for scaling.

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13. ANNEX

Annex 1. Globally listed vulnerable, endangered, and critically endangered species in Timor-Leste or its territorial waters. (M = migrant)

Species	Scientific name	Global Status
Fish		
Camouflage Grouper	*Epinephelus polyphekadion*	Vulnerable
Giant wrasse	*Cheilinus undulatus*	Endangered
Squaretail Coralgrouper	*Plectropomus areolatus*	Vulnerable
Azure Demoiselle	*Chrysiptera hemicyanea*	Vulnerable
Harlequin Filefish	*Oxymonacanthus longirostris*	Vulnerable
Hardyhead	*Craterocephalus laisapi*	Endangered
Brown-marbled Grouper	*Epinephelus fuscoguttatus*	Vulnerable
Giant Guitarfish	*Glaucostegus typus*	Critical
Green Sergeant	*Amblyglyphidodon batunai*	Vulnerable
Ternate Damsel	*Amblyglyphidodon ternatensis*	Vulnerable
Goby	*Gobiodon aoyagii*	Vulnerable
Bigeye Tuna	*Thunnus obesus*	Vulnerable
Red-spotted Coral-goby	*Gobiodon erythrospilus*	Vulnerable
Turtles		
Roti Snake-necked Turtle	*Chelodina mccordi*	Critical
Southeast Asian Box Turtle	*Cuora amboinensis*	Endangered
Green Turtle	*Chelonia mydas*	Endangered
Reeves' Turtle	*Mauremys reevesii*	Endangered
Snakes		
Dusky Sea Snake	*Aipysurus fuscus*	Endangered
Birds		
Timor Green Pigeon	*Treron psittaceus*	Endangered
Yellow-crested Cockatoo	*Cacatua sulphurea*	Critical
Wetar Ground-dove	*Pampusana hoedtii*	Endangered
Sharp-tailed Sandpiper (M)	*Calidris acuminata*	Vulnerable
Far Eastern Curlew (M)	*Numenius madagascariensis*	Endangered
Great Knot (M)	*Calidris tenuirostris*	Endangered
Pale-bellied Myna	*Acridotheres cinereus*	Vulnerable
Matsudaira's Storm-petrel (M)	*Hydrobates matsudairae*	Vulnerable
Christmas Island Frigatebird	*Fregata andrewsi*	Vulnerable
Sharks, sawfish, and rays		

Grey Reef Shark	*Carcharhinus amblyrhynchos*	Endangered
Spinetail Devil Ray	*Mobula mobular*	Endangered
Blacktip Reef Shark	*Carcharhinus melanopterus*	Vulnerable
Green Sawfish	*Pristis zijsron*	Critical
Christmas Island Frigatebird	*Fregata andrewsi*	Vulnerable
White Shark	*Carcharodon carcharias*	Vulnerable
Blacktip Shark	*Carcharhinus limbatus*	Vulnerable
Largetooth Sawfish	*Pristis priests*	Critical
Graceful Shark	*Carcharhinus amblyrhynchoides*	Vulnerable
Javanese Cownose Ray	*Rhinoptera javanica*	Endangered
Whitetip Reef Shark	*Triaenodon obesus*	Vulnerable
Zebra Shark	*Stegostoma tigrinum*	Endangered
Bowmouth Guitarfish	*Rhina ancylostoma*	Critical
Blotched Fantail Ray	*Taeniurops meyeni*	Vulnerable
Pelagic Thresher	*Alopias pelagicus*	Endangered
Spotted Eagle Ray	*Aetobatus ocellatus*	Vulnerable
Scalloped Hammerhead	*Sphyrna lewini*	Critical
Reef Manta Ray	*Mobula alfredi*	Vulnerable
Shortfin Mako	*Isurus oxyrinchus*	Endangered
Narrow Sawfish	*Anoxypristis cuspidate*	Endangered
Bottlenose Wedgefish	*Rhynchobatus australiae*	Critical
Pigeye Shark	*Carcharhinus amboinensis*	Vulnerable
Longhorned Pygmy Devil Ray	*Mobula eregoodoo*	Endangered
Sicklefin Devil Ray	*Mobula tarapacana*	Endangered
Tawny Nurse Shark	*Nebrius ferrugineus*	Vulnerable
Common Thresher	*Alopias vulpinus*	Vulnerable
Sharptooth Lemon Shark	*Negaprion acutidens*	Endangered
Bigeye Thresher	*Alopias superciliosus*	Vulnerable
Bentfin Devil Ray	*Mobula thurstoni*	Endangered
Shorthorned Pygmy Devil Ray	*Mobula kuhlii*	Endangered
Longfin Mako	*Isurus paucus*	Endangered
Mammals		
Long-tailed Macaque	*Macaca fascicularis*	Endangered
Java Deer	*Rusa timorensis*	Vulnerable
Dugong	*Dugong dugon*	Vulnerable
Sperm Whale	*Physeter macrocephalus*	Vulnerable
Blue Whale	*Balaenoptera musculus*	Endangered
Timorese Horseshoe Bat	*Rhinolophus montanus*	Endangered

Gray Flying Fox	*Pteropus griseus*	Vulnerable
Large Flying-fox	*Pteropus vampyrus*	Endangered
Plants		
Waterwheel	*Aldrovanda vesiculosa*	Endangered
Acacia	*Acacia wetarensis*	Vulnerable
Persian Shield	*Strobilanthes orientalis*	Critical
Indian Sandalwood	*Santalum album*	Vulnerable
Timor White Gum	*Eucalyptus urophylla*	Endangered
Burmese rosewood	*Pterocarpus indicus*	Endangered
Eucalyptus	*Eucalyptus orophila*	Critical
Echinoderms		
White teeth sea cucumber	*Holothuria fuscogilva*	Vulnerable

Annex 2. Protected areas of Timor Leste. Data from SPREP, Protected Planet, MALFF, and NBSAP (2015) with recent marine protected area data from UNDP (NM = area not yet measured)

Name	Designation	Land area	Marine area	IUCN category	Management plan	Status	Status year
Monte Lakus/Sabi	Protected Area	NM		Not Reported	Not Reported	Designated	2016
Mount Cutete	Protected Area	133.0 km²		Not Reported	Not Reported	Designated	2016
Lagoa BikanTidi	Protected Area	1.10 km²		Not Reported	Not Reported	Designated	2016
Monte Burabo'o	Protected Area	185.0 km²		Not Reported	Not Reported	Designated	2016
Lagoa HasanFoun & OnuBot	Protected Area	0.12 km²		Not Reported	Not Reported	Designated	2016
Lagoa Tasitolu	Protected Area and marine area	2.78 km²	1.0 km²	Not Reported	Not Reported	Designated	2016
BeMatanIrabere	Protected Area	0.00 km²		Not Reported	Not Reported	Designated	2016
Lagoa Welenas	Protected Area	0.20 km²		Not Reported	Not Reported	Designated	2016
Batugadé	Marine Natural Reserve		1.13 km²	Not Reported	Yes	Designated	2016
Korluli	Protected Area	NM		Not Reported	Not Reported	Designated	2016
Lagoa Maubara	Protected Area	NM		Not Reported	Not Reported	Designated	2016
SamikSaron	Protected Area	NM		Not Reported	Not Reported	Designated	2016
Lagoa BeMalae	Protected Area	NM		Not Reported	Not Reported	Designated	2016
Makfahik	Protected Area	NM		Not Reported	Not Reported	Designated	2016
Suco de Vila	Marine Natural Reserve	0.51 km²	0.51 km²	Not Reported	Yes	Designated	2016
UsMetan	Protected Area	2.00 km²		Not Reported	Not Reported	Designated	2016
Area Mangal Hera	Protected Area	1.16 km²	1.16 km²	Not Reported	Not Reported	Designated	2016
Behau	Marine Protected Area		274.9 km²	Not Reported	Not Reported	Proposed	2008
Ek Oni	Protected Area	7.00 km²		Not Reported	Not Reported	Designated	2016
Area Mangal Metinaro	Protected Area	9.05 km²	9.05 km²	Not Reported	Not Reported	Designated	2016
Atauro Island	Marine protected areas		25.18 km²	IV	Yes	Designated	2023
Lamsanak	Marine Protected Area		150.64 km²	Not Reported	Not Reported	Proposed	2008
Oebatan	Protected Area	4.00 km²		Not Reported	Not Reported	Designated	2016
Lagoa Modomahut	Protected Area	0.22 km²		Not Reported	Not Reported	Designated	2016
Mount Loelako	Protected Area	47.00 km²		Not Reported	Not Reported	Designated	2016
Mount Aitana	Protected Area	170.0 km²		Not Reported	Not Reported	Designated	2007

Name	Designation	Land area	Marine area	IUCN category	Management plan	Status	Status year
Manufahi	Marine protected area		51 km^2	IV	Yes	Designated	2024
Ribeira de Clere	Protected Area	300.0 km²		Not Reported	Not Reported	Designated	2000
Monte Manucoco	Protected Area	21.37 km²		Not Reported	In development	Designated	2000
Mount Bibileo	Protected Area	190.0 km²		Not Reported	Not Reported	Designated	2007
Mount Taroman	Protected Area	191.55 km²		Not Reported	Not Reported	Designated	2007
Mount Laretame	Protected Area	164.29 km²		Not Reported	Not Reported	Designated	2007
Lagoa Maurei no Alafalu	Protected Area	5.00 km²		Not Reported	In development	Designated	2007
Nino Konis Santana and Jaco Island	National Park and Marine PA	1236.0 km²	588.99 km²	IV	Final draft	Designated	2008
Mount Tatamailau	Protected Area	200.0 km²		Not Reported	Not Reported	Designated	2000
Mount Kuri	Protected Area	17.66 km²		Not Reported	Not Reported	Designated	2007
Mount Matebian	Protected Area	240.0 km²		Not Reported	Not Reported	Designated	2000
Monte Diatuto	Protected Area	150.0 km²		Not Reported	Not Reported	Designated	2000
Mount Builo	Protected Area	80.00 km²		Not Reported	Not Reported	Designated	2007
Mount Mundo Perdido	Protected Area	133.0 km²		Not Reported	Not Reported	Designated	2000
Mount Guguleur	Protected Area	131.59 km²		Not Reported	Not Reported	Designated	2007
Parke Nasional Kay Rala Xanana Gusmao	National Park	92.31 km²		Not Reported	Not Reported	Designated	2015
Cristo Rei	Protected Area	17.54 km²		Not Reported	In development	Designated	2000
Mount Manoleu	Protected Area	200.0 km²		Not Reported	Not Reported	Designated	2007
Mount Fatumasin	Protected Area	40.0 km²		Not Reported	In development	Designated	2000
Mount Legumau	Protected Area	359.67 km²		Not Reported	Not Reported	Designated	2007
Tilomar	Reserved Forest	57.0 km²		Not Reported	Not Reported	Designated	2000
Mount Tapo/Saburai	Protected Area	500.0 km²		Not Reported	Not Reported	Designated	2007
Maubara Lake	Aquatic Protected area	NM		Not Reported	Not Reported	Designated	
Samba Sembilan	Marine protected area		80 km^2	Not Reported	Not Reported	Designated	2023

Annex 3. Details of the consultations workshop and bilateral meetings held to gather relevant information and community and stakeholder feedback and consent

I. Regional Stakeholder Consultation Workshop – Manufahi

Workshop Title: Regional Stakeholder Consultation Workshop for NBSAP Progress Review – Manufahi

Date: 6 October 2025

Venue: Same, Manufahi Municipality, Timor-Leste

Main Objectives

The Regional Stakeholder Consultation Workshop in Manufahi was organized to gather localized perspectives and evidence to inform the revision of Timor-Leste's NBSAP. The workshop aimed to assess the contribution of biodiversity to local livelihoods and nature–people relationships, identify key threats and existing community responses, and understand the differentiated roles and challenges of women, youth, and local communities in biodiversity management. It also sought to identify priority capacity-building needs, financing opportunities, and institutional responsibilities required to strengthen effective, inclusive, and locally grounded implementation, monitoring, and evaluation of the NBSAP.

Outcomes

Participants from local communities, women's groups, youth, local governments, academia, and civil society highlighted biodiversity as central to daily life, underpinning food security, water availability, habitat provision, oxygen supply, and traditional medicine. The consultation identified major pressures on biodiversity, including illegal hunting, unsustainable farming practices, destructive fishing methods, deforestation, and weak enforcement of environmental regulations.

Women emphasized their critical role in household-level conservation, natural resource stewardship, and water source protection, while also noting constraints such as limited representation in decision-making and insufficient access to leadership and skills development opportunities. Youth recognized biodiversity-based livelihoods as an important opportunity for employment but highlighted barriers related to limited finance, infrastructure, training, and innovation exposure. Local governments expressed readiness to take on a more active role in NBSAP implementation, particularly in technical support, legislation, monitoring, financing, and procurement. Overall, the workshop reinforced strong consensus on the importance of community-based conservation, the recognition of customary governance systems such as *Tara Bandu*, and targeted capacity development across stakeholder groups.

Key Recommendations

- Strengthen community-based biodiversity management by formally recognizing and supporting customary governance mechanisms such as *Tara Bandu*, alongside improved enforcement of environmental laws.
- Invest in targeted capacity-building programmes for IPLCs, women, youth, and local governments, focusing on leadership, sustainable livelihoods, conservation practices, technology, and innovation.
- Enhance the role of local governments in NBSAP implementation through clearer mandates, technical assistance, and access to financial and procurement mechanisms.
- Integrate gender-responsive and youth-focused actions into the NBSAP to ensure meaningful participation, reduced discrimination, and equitable benefit-sharing.
- Promote biodiversity-friendly livelihood opportunities and sustainable financing mechanisms that link conservation outcomes with local economic development.

II. National Stakeholder Consultation Workshop – NBSAP Revision

Workshop Title: National Stakeholder Consultation Workshop on NBSAP Revision

Date: 8 October 2025

Venue: Dili, Timor-Leste

Main Objectives

The National Stakeholder Consultation Workshop was convened to review progress on the revision of the NBSAP and to consolidate inputs from regional consultations and sectoral institutions. The workshop aimed to strengthen alignment of the updated NBSAP with KMGBF and national development priorities. Key objectives included clarifying institutional roles and responsibilities, identifying capacity and financing gaps, strengthening biodiversity monitoring and reporting systems, promoting inclusive engagement of women, youth, and IPLCs, and prioritizing actions with clearly defined leadership for effective implementation.

Outcomes

Participants from government ministries, civil society organizations, academia, and the private sector confirmed the need to strengthen technical and scientific capacity in biodiversity assessment, monitoring, and data management, alongside improvements in institutional governance, coordination, and resource mobilization. The importance of coordinated and sustained stakeholder engagement emerged as a core requirement for successful NBSAP implementation.

The workshop reaffirmed the essential role of women and local communities in biodiversity conservation, including in fisheries, agrobiodiversity, reforestation, and environmental education, and emphasized their inclusion as leaders, decision-makers, and implementers of monitoring and evaluation. Local governments were recognized as key actors in awareness-raising, enforcement of *Tara Bandu*, quality control, and monitoring of biodiversity actions. The private sector was acknowledged as both a beneficiary of biodiversity and a potential contributor to sustainable biodiversity financing through mechanisms such as ecotourism fees, certification schemes, and biodiversity funds. Participants also provided substantive inputs to NBSAP targets and actions, including improving biodiversity data accessibility, strengthening species protection, promoting sustainable agriculture and aquaculture, addressing waste management, integrating traditional knowledge, and defining water quality standards for both human use and ecosystem health.

Key Recommendations

- Strengthen national capacity in biodiversity assessment, monitoring, data management, and specialized technical skills through sustained institutional and governance reforms.
- Institutionalize inclusive participation of women, youth, and IPLCs in NBSAP implementation and monitoring, with clearly defined leadership and decision-making roles.
- Enhance national biodiversity monitoring, learning, reporting, and verification systems to ensure alignment with KMGBF targets and international reporting requirements.
- Mobilize sustainable biodiversity financing through enabling policies, incentives, and partnerships with the private sector, including blended finance mechanisms.
- Prioritize and sequence NBSAP actions with clearly defined lead and supporting institutions, ensuring coherence with national policies, spatial planning, and development strategies.

III. Regional Consultation Workshop – Liquiça

Workshop Title: Regional Consultation Workshop on the Revision of the National Biodiversity Strategy and Action Plan (NBSAP) 2026–2030

Date: 9 December 2025

Venue: Liquiça Municipality Meeting Hall, Liquiça, Timor-Leste

Main Objectives

The Liquiça Regional Consultation Workshop was organized to present the draft NBSAP (2026–2030) to community-level stakeholders and gather feedback on its relevance to local realities.

The workshop aimed to capture the perspectives of local communities, women, and youth on biodiversity, ecosystems, and ecosystem services; identify key challenges, threats, and vulnerabilities faced by communities; validate the integration of local knowledge, customary practices, and institutions into national biodiversity strategies; and strengthen coordination between communities, government institutions, and development partners for effective implementation.

Outcomes

Participants strongly recognized biodiversity as a foundation for livelihoods, food security, and economic activities, particularly in marine and coastal areas. Major threats identified included illegal fishing, coral extraction, mangrove cutting, improper waste management, wildfires, water scarcity in upland areas, and weak enforcement of environmental regulations.

The consultation highlighted gaps in institutional coordination, limited community awareness, and insufficient budget allocation for biodiversity capacity building. Participants called for improved awareness programmes, stronger enforcement of environmental laws and *Tara Bandu*, and clearer communication of NBSAP targets and actions at the local level. The workshop successfully engaged a wide range of stakeholders, including municipal authorities, sectoral departments, civil society organizations, academia, community leaders, and national institutions.

Key Recommendations

- Strengthen community-based biodiversity conservation and formally integrate customary practices such as *Tara Bandu* into NBSAP implementation.
- Enhance capacity-building and public awareness programmes, particularly for coastal and upland communities in biodiversity-rich areas.
- Promote alternative and sustainable livelihood options to reduce reliance on environmentally harmful activities such as coral harvesting.
- Improve enforcement, monitoring, and coordination among government agencies, local authorities, and communities, including clearer demarcation and signage of protected areas.
- Ensure adequate budget allocation and institutional support for biodiversity conservation, monitoring, and local capacity development.

IV. National Validation Workshop

Workshop Title: National Validation Workshop on the Revision of the National Biodiversity Strategy and Action Plan (NBSAP) 2026–2030

Date: 11 December 2025

Venue: Dili, Timor-Leste

Main Objectives

The National Validation Workshop was convened to present the consolidated draft of the updated NBSAP 2026–2030 for final review and validation by national stakeholders. The workshop aimed to consolidate inputs from regional and national consultations, review targets, priority actions, monitoring frameworks, spatial planning components, capacity-building needs, and financing mechanisms, ensure cross-sectoral policy coherence, and outline next steps toward government endorsement and submission to the UNCBD Secretariat.

Outcomes

Stakeholders validated the overall structure, vision, targets, and strategic direction of the NBSAP 2026–2030 while identifying key areas for strengthening. These included institutional coordination, prioritization of actions, integration of biodiversity–health linkages, improved coverage of freshwater and marine ecosystems, management of invasive species, and stronger alignment with climate frameworks such as the NAP, NDC, and Article 6 mechanisms.

The workshop emphasized the need to improve spatial planning data, update biodiversity and protected area maps, clarify institutional roles and responsibilities, and better reflect Timor-Leste's vulnerability as a Least Developed Country (LDC) and Small Island Developing State (SIDS) to enhance access to international financing. Strong consensus emerged on the importance of inclusive participation of women, youth, and IPLCs, and the recognition of traditional knowledge in biodiversity governance.

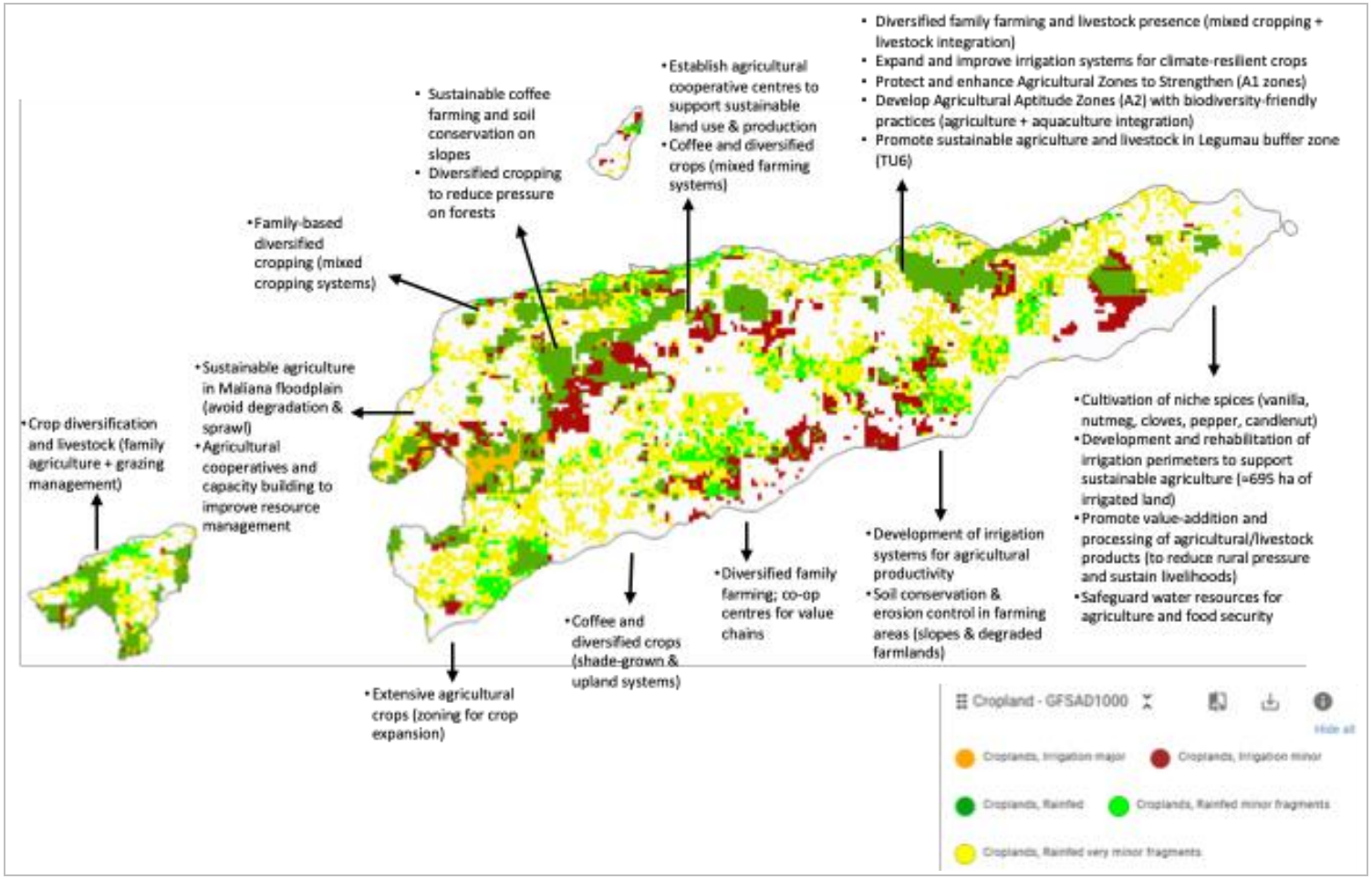
Key Recommendations

- Strengthen institutional coordination and clearly define lead and supporting agencies for each NBSAP target and action.
- Prioritize NBSAP actions through a clear and realistic implementation roadmap, including a concise summary of top national priorities for decision-makers.
- Enhance integration of biodiversity considerations with climate change, health, water security, spatial planning, and infrastructure development.
- Update and harmonize biodiversity, land use, and marine spatial data to support effective monitoring, reporting, and decision-making.

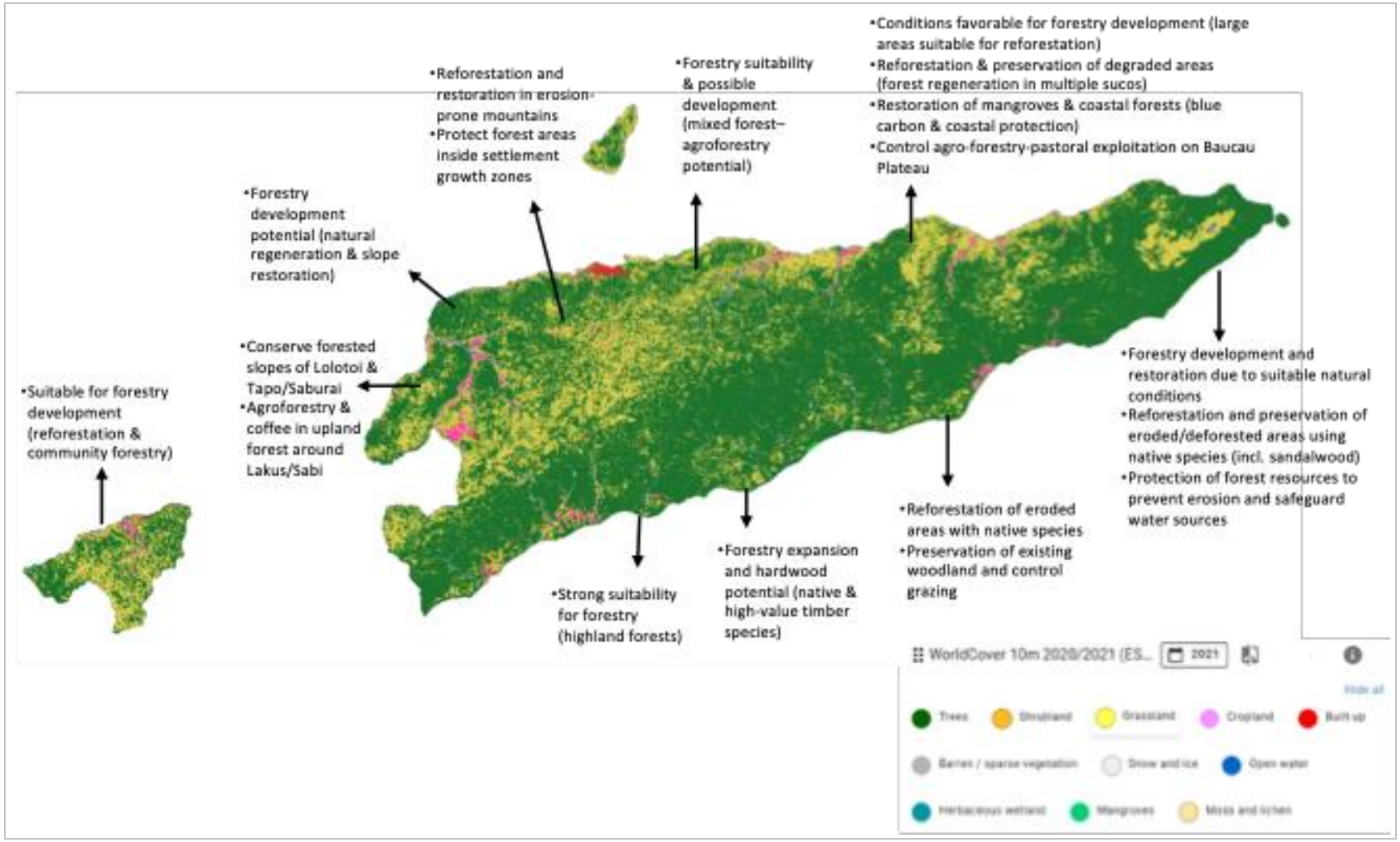
Mobilize sustainable financing for biodiversity through national budget allocations, private sector engagement, carbon and blue economy opportunities, and international funding mechanisms.

Annex 4. Spatial planning maps for biodiversity actions relevant for NBSAP for different sectors (The figures in Annex 4 were derived from the Spatial Planning documents. The activities presented in these figures are relevant for NBSAP and need to be considered by respective sectoral ministries and departments while implementing the NBSAP. These are not exhaustive list of actions presented in the NBSAP, but examples taken from the spatial planning report.

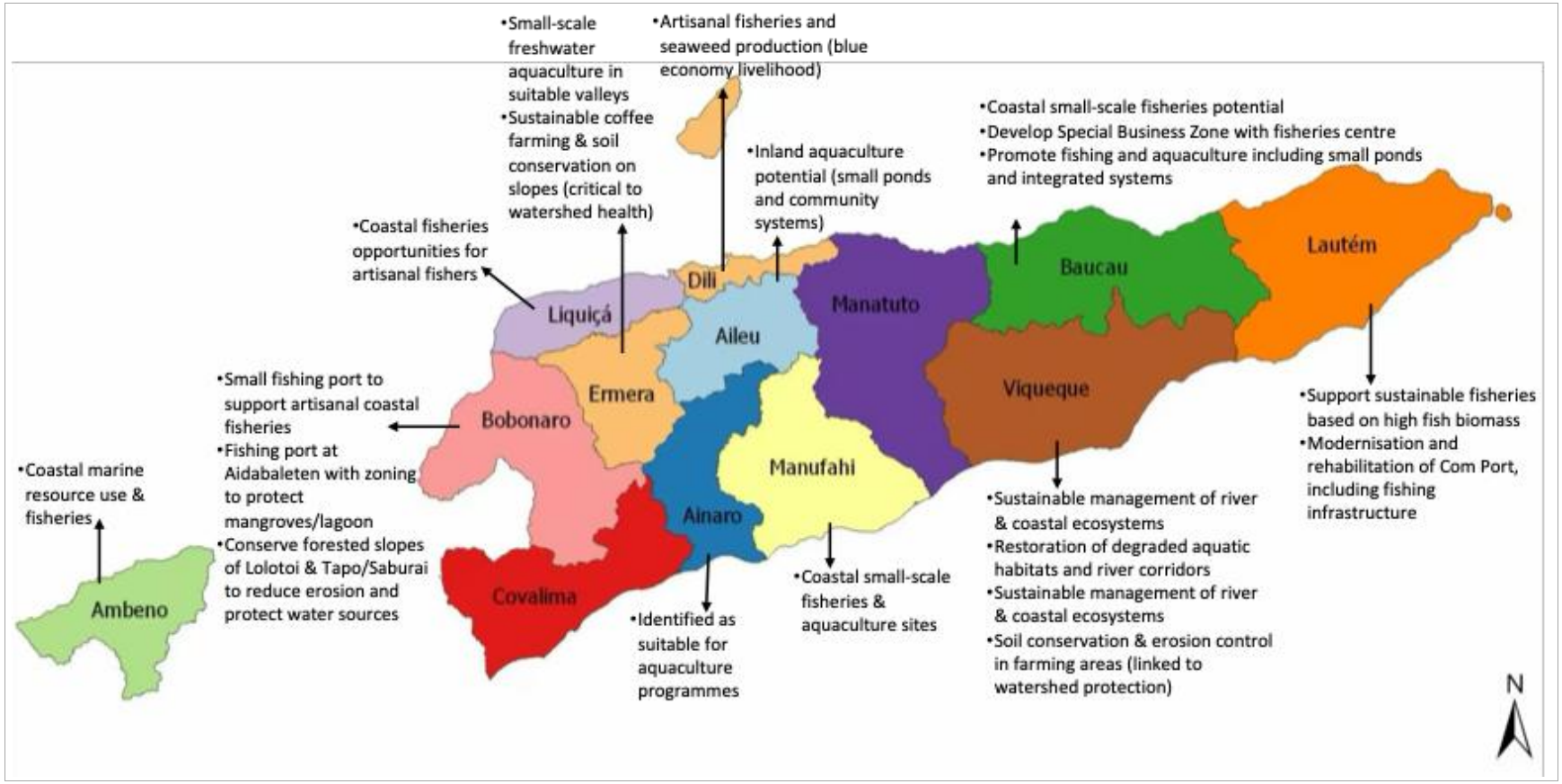
Agriculture sector



Forestry sector



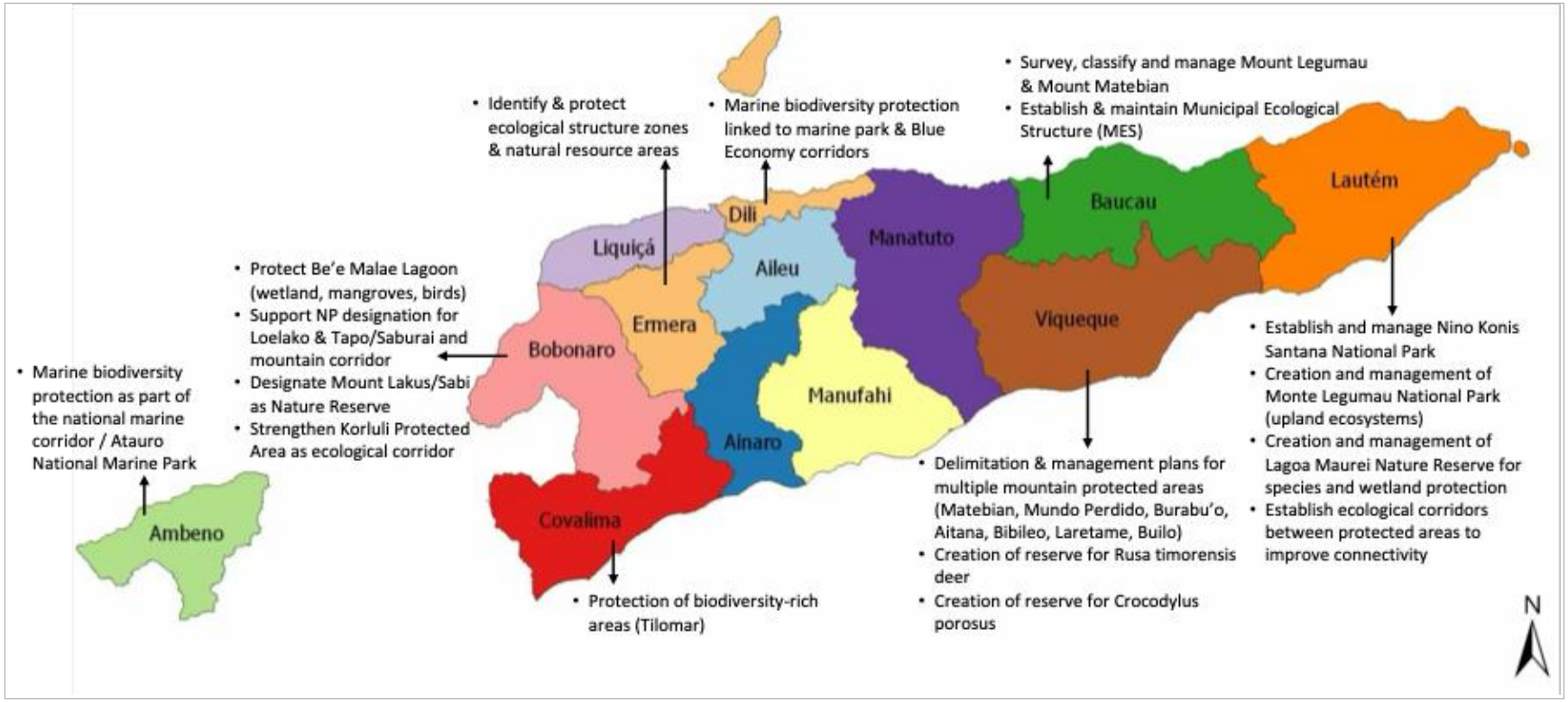
Fisheries and aquaculture



Tourism


•Marine ecotourism (coral reefs, diving, whale watching)
•Nature/beach/heritage tourism potential
•Develop Tourism Aptitude Zones (TAZ) with biodiversity-friendly management
•Ecotourism & rural tourism on Mount Mundo Perdido & Matebian
•Beach & sea tourism linked to reefs and lagoons
•Nature and mountain tourism potential
•Ecotourism linked to coffee landscapes & mountains
•Coastal/community-based ecotourism
Dili
Liquiçá
Aileu
Manatuto
Baucau
Lautém
Ermera
Viqueque
Bobonaro
•Cultural tourism around Balibó town & nature
•Coastal tourism linked to mangroves & wetlands
•Spa and wellness tourism based on hot springs
Manufahi
Ainaro
Covalima
Ambeno
•Coastal and cultural tourism potential
•Nature and coastal tourism potential (Eastern zone)
•Ecotourism linked to beaches, coral reefs, and Jaco Island
•Construction of entrance gate and visitor infrastructure to support tourism
•Trail between three lagoons to promote nature tourism
•Identify and protect future tourism attraction points (cultural, natural, historical)
•Nature-based tourism linked to mountain PAs
•Tourism development associated with Lagoa Maurei
•Coastal and inland eco-tourism potential
•Highland ecotourism potential
•Coastal and nature-based tourism
N

Protected Areas



Annex 5. Summary of actions for different municipalities, prepared based on bilateral meetings with government officials, consultation workshops, and local experts' own judgment (Complementary actions to the ones included in the Targets description)

Municipalities	Agriculture and livestock	Fisheries and Aquaculture	forestry (Protected areas)	Tourism	notes
Baucau	• Dump Construction to increase agricultural production; Determine location for raising Buffalo and cow		• Community nursery Suco Tirilolo, Baucau Vila - municipality of Baucau.		
Bobonaro	• Determine location for raising Buffalo and cow	• Komunidade Bobonaro is a new proposing MPA with the total area of 254.17ha	• Community nursery Suco Tapo Memo-Maliana Vila- Bobonaro. • Sandalwood plantation in Atabae PA, Suco Aidaba-Leten		
Covalima	• Determine location for raising Buffalo and cow		• Community nursery Suco Dais, PA Maukatar, municipality of Covalima. • Plantation Comercial trees in Zulo, Covalima, Zumalai. • Mangrove restoration in Suai Loro.		
Lautem	• Determine location for raising Buffalo and cow	• Proposing to be declare as marine protected area and will be named Dugong and Seagrass. With the total area of 341.80ha. NBSAP target 3 of key action 3.8 increase MPAs	• Permanent nursery in Pato-lospalos, Lautém • Nino Koni Sanatana National Park become biosphere reserve UNESCO. • Develop Arboretum in NKS National Park of Lautém Municipality. • Biodiversity conservation for threaten species, in NKS National Park by establishing water sallination for wildlife e.g. deer (Cervus timorense, aves phalangger orientalis and fauna. • Work with community group in gathering turtle nesting in Lore and Com, Lautém, as an ongoing activity, including capacity building.		

Manatututo	• Determine location for raising Buffalo and cow	• New proposing MPA of Manufahi/Manatuto, total area 50,296ha	• Afforestation 130ha. • Community nursery in Laclo – Manatuto. • Establish of Chack dam in Comoro and laclo watershed management		• Each community nurseries has produced 10k of seedlings.
Manufahi	• Determine location for raising Buffalo and cow. • Local poultry farm (Manu Mareko) and sheep farming in Suco Dotik. • Reactivating pig farm center in Suco Dotik, budget has been allocated and will be implemented in 2026.	• New proposing MPA of Manufahi/Manatuto, total area 50,296ha	• Permanent nursery in Betano-manufahi		• 11k seedlings produced by central and permanent nurseries
	• Establishing 5 centers for processing and development of local buffalo for producing buffalo milk.				
	• Planting *Lamtoro taramba* grass with local community with a total area of 2ha from each community group in 7 municipalities including Atauro Island as well as raising sheep				
Viqueque	• Determine location for raising Buffalo and cow		• Permanent nursery in Ratau, Viqueque. • Forest plantation in Viqueque, PA Lacluta Suco Ahik – ongoing activity. • International day for mangrove 26 July, including mangrove plantation activity in Viqueque, PA Uatucarbau.		

Atauro Island		• Seaweed cultivation and harvesting activities as one of the significant activities for generate income by the coastal communities. • Support to the Atauro Fisheries with the small-scale activity by providing fishing facilities, e.g. gill nets, purse seine, hook and line, and etc. • New proposing MPA of Atauro with the total area 13,252.22ha	• Community nursery in Suco Vila Atauro, municipality of Atauro. • Mangrove restoration in Suco Bikeli	• Diving and snorkeling: Ex plore the marine biodiversity of the Coral Triangle around islands like Atauro, which boasts the highest diversity of reef fish and coral species on Earth	
Liquica		• New proposing MPA, named as Samba Sembilan, total area 8372.20ha. NBSAP target 3 of key action 3.8 • Komunidade Vatuvou - Maubara, new proposing MPA with the total 81ha	• Liquica 3ha 2025 agroforestry. • Seedlings production or nursery center permanet in Liquiça. • Support the coastal community to develop ecotourism in protected areas Guguleur, Fatumasi, Jeju – Timor-leste forest friendship in Maubara lake protected area, ongoing activity.		
Dili		• With high potential to be declared as new MPA, which is Metinaro, with a total area 6,369ha	• Reforestation and agroforestry activity in Metinaro 4ha reforestation 2025. • Build tracking facility in mangrove protected area of Metinaro for ecotourism – ongoing activity. • Mangrove restoration in Tasi tolu lake and Metinaro Post Administrative 2025		

Aileu			• 20ha for natural regeneration. • Community nursery in Suco Aisirimou municipality of Aileu. • Developed Francisco Xavier do Amaral Botanical Garden.		
Ainaro			• reforestation activity covers of 4ha 2024. • Community nursery in Suco Manutasi, municipality of Ainaro. • Preparation for Officially Declare of Kayrala Xanana Gusmao National Park in Municipalities Manufahi and Ainaro 2025.		
Ermera			• Agroforestry activity covers of 3ha in 2024. • Community nursery in Suco Fatukero – Railaku, municipality of Ermera.		
			• Community awareness raising activities in every community that living surrounding the protected areas		
			• Survey and Demarcation to the protected areas. 2006 -2025 the forestry department have conducted survey and demarcated 22 Protected areas out of 46 protected areas.		
			• Installation of information board in forest and protected areas.		
			• Production trees and inventory of teak trees.		
			• National Day celebration for Sandalwood plantation 13 January		
			• International Forest Day 21 March		
			• Establish of watershed management in talau and motamasin		

Annex 6. Monitoring framework designed for monitoring NBSAP implementation and progress

Targets and Actions	Priority level	Baseline	Target	Indicative timeline	Responsible organization
1. By 2030, ensure that all areas are under integrated, biodiversity-inclusive spatial planning and effective management to address changes in land and sea use, particularly by reducing the loss of areas of high biodiversity importance and ecosystems with high ecological integrity, while respecting the rights of local communities.					MALFF, MTE
1.1. Develop maps of ecosystem integrity, forest connectivity, biodiversity hotspots, as well as priority degraded areas for targeted spatial planning to improve ecological connectivity, by integrating gender-disaggregated data on land tenure security, access to natural resources and technologies (ongoing)	H	0	10	2026	MALFF
1.2. Develop and implement land, coastal, and sea conservation and use plans using integrated and landscape approaches to reduce negative impacts on biodiversity, with gender-balanced participation in planning and decision-making bodies and a minimum of 30% women in consultations (ongoing: ATSEA Project; PEMSEA)	H	0	2	2028	MALFF
1.3. Develop and implement Marine Spatial Planning within the framework of the 'Blue Economy' to ensure a clean, healthy, productive and biologically diverse marine area (Ongoing: ATSEA Project; PEMSEA)	H	0	1	2030	MTE
1.4. Develop a possible partnership with UNESCAP/UNESCO and other relevant organizations for the remote sensing of landscapes to assist in spatial planning and populating indicators of connectedness	H	NA	NA	2026-2030	MPSI
2. By 2030, degraded areas of forests, agricultural lands, inland waters, and coastal and marine areas are mapped and 20% are restored to improve biodiversity, connectivity, and ecosystem integrity.					MALFF
2.1. Develop a revised forest cover and degraded areas map and complete the mapping of degraded coastal and marine areas	H	0	13	2030	Secretary of State for Forestry
2.2. Plant 1 million trees per year (>600 ha/year) in priority degraded sites including in deforested watersheds, to increase landscape connectivity and habitat quality, ensuring at least 30% women's participation among labourers (Ongoing MALFF programme)	H	>600/ha	>900/ha	2030	MALFF
2.3. Recover 200 ha of mangrove forest annually and promote community-led conservation and mangrove stewardship by adopting public-private partnerships	H	30.5ha	152.5ha	2030	MALFF
2.4. Complete restoration planning in Ninura River, and Mota-Masin River Basin with learning from Kamora River Basin (Ongoing MALFF programme)	H	1	2	2030	MALFF
2.5. Recover soil function through the expanded use of organic fertilisers and restore 500 ha of degraded farmland and wilderness	H	1ha	500ha	2030	MALFF
3. By 2030, ensure at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed					MALFF, MTE

through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, and integrated into wider landscapes and seascapes, while ensuring that sustainable uses are fully consistent with conservation outcomes, recognizing and respecting the rights of local communities.					
3.1. Finalize and implement the management plans and governance systems for all National Parks and 3 other protected areas in consultations with local communities (Ongoing MALFF programme)	H	0	2	2025-2030	MALFF
3.2. Continue working towards creating protected areas at Manatuto, Baucau, and Covalima following social and environmental impact assessments	M	6	9	2030	ND FOR Protected AREAS
3.3. Continue efforts to create an International Marine Peace Park with Indonesia (Ongoing MALFF programme)	L	0	1	2030	MALFF
3.4. Improve visitor services at Nino Konis National Park and at Kayrala Xanana Gusmao National Park to improve the attraction to tourists, in part through further training of local communities for park management	M	0	2	2030	MALFF
3.5. Establish at least 10 new LMMAs and 300+ ha of new community forest, with 3 CF committees established (learning from Ulmera, Natarbora, Hera, Metinaro and Tasi Tolu community forests can be replicated)	M	3	5	2030	MALFF
3.6. Assist LMMAs and CFs near PAs to achieve Asean CBT certification to encourage ecotourism, ensuring balanced participation of women and men in CBT training, decision-making, and certification, and gender-responsive benefit-sharing mechanisms	M	0	5	2030	MALFF
3.7. Finalize the Atauro National Marine Park and conduct a biodiversity assessment to include mapping of coral reefs at the Park (Ongoing MALFF programme)	H	0	1	2030	Forestry Department
3.8. Conduct connectivity and gap analyses, loss and gain assessment and biodiversity indices analysis of PAs and OECM	H	0	1	2030	Forestry Department
3.9. Establish buffer zones and integrate small and adjacent PAs to improve connectivity	M	0	46	2030	Forestry Department
3.10. Establish a multi-stakeholder, gender-balanced, protection area management authority and community conservation committee for 47 identified locations, consisting of government, municipal authorities, and local community representatives	H	2	3	2026-2030	MALFF
3.11. Train PA staff in sustainably PA management and governance and monitoring performance and changes of PAs with time	H	0	3	2026-2020	Forestry Department
3.12. Designate new marine PAs to reach to a total of 23 (currently 23 are the permanent PAs and 2 marine PAs)	L	2	3	2030	MALFF
3.13. Complete a national strategy and action plan (e.g., tourist tax collection), along with Standard Operating Procedures (SOPs) and business plans on the sustainable development of protected areas	H	0	1	2026-2030	MALFF/Forestry Directorate

3.14. Conduct biennial Protected Area Management Effectiveness Tracking Tool (METT) to monitor change and aid adaptive management and link results-with performance-based funding, ensuring women's participation in METT assessments	H	0	2	2028, 2030	Forestry Department
4. By 2030, threatened species and genetic diversity will be protected through the development of a formal process to list threatened species, develop prevention, management and recovery plans for endangered or critically endangered species through *in situ* and *ex situ* conservation and sustainable management practices of native, wild and domesticated species, and reduce human-wildlife conflicts					MALFF
4.1. Appoint a threatened species expert committee with a term of reference to (i) compile and examine the evidence for the status of possible threatened species and (ii) to propose species for protective listing to government based on the best available evidence	M	0	1	2030	NDB/MTE
4.2. Develop and implement Monitoring and Recovery Plans for 10 priority endangered species, engaging women in field monitoring and community awareness activities, and promoting equitable benefit sharing	M	0	1	2026-2030	NDB/MTE
4.3. Determine the critical habitats for all species listed as threatened or endangered	M	1	2	2026-2030	NDB/MTE
4.4. Capture 100% of the critical habitats for terrestrial threatened species and 50% of the habitat of marine threatened species in at least one protected area (Ongoing MALFF programme)	L	0	0	2030	MALFF
4.5. Improve enforcement of existing regulations to protect threatened species by hiring and training additional staff recruiting and training women as enforcement officers and ensuring gender-sensitive workplace policies and safety measures	M	1	3	2030	MTE/ MALFF
4.6. Establish a National Centre for Cetacean Regulation, Research, and Control. (cf. Target 10)	L	0	1	2030	MALFF
4.7. Develop strategy for maintaining and restoring the genetic diversity of native, wild and domesticated species *in situ*	M	0	1	2028	MALFF
4.8. Strengthen the national genebank through advanced management tools and techniques in regeneration, multiplication and maintenance *ex situ*	M	0	1	2030	MALFF
5. Management plans are being completed and implemented for commonly harvested wildlife species (marine and terrestrial), with a focus on those that are being over-exploited and commercially traded, through direct consultation with local communities by 2030					MALFF
5.1. Provide training, develop data, and an understanding of which species are hunted/fished, the rates of harvesting of each species, and which species are declining in collaboration of communities, ensuring gender-balanced participation (minimum 30% women) and inclusion of women's traditional knowledge and gender-specific roles in resource use	M	0	2	2030	MALFF
5.2. Develop mechanisms and increase enforcement to reduce harvests of over-exploited species, including through the use of *Tara Bandu*, and closed areas in	H	0	2	2025	MALFF

collaboration of LMMAs and CFs promoting alternative livelihoods that address gender-specific dependence on marine and forest resources (Ongoing MALFF programme, with WorldFish and Blue Ventures)					
5.3. Conduct inclusive stakeholder consultation/socialization in formulation and awareness creation on the National Biodiversity Law/Decree and Wildlife Conservation Law	M	1	2	2027	MTE/NDB
5.4. Build Crocodile Management Parks, increasing beach safety while conserving the species and promoting the tourist attraction of an animal that is a formal symbolic representation of Timorese identity	H	0	1	2026	NDB
5.5. Develop policies, action plans, and legal frameworks for the management of selected wild species harvested for local economy and livelihood using ecosystem approach	M	0	1	2028	NDB
5.6. Develop legislation and monitoring, control and surveillance systems to combat Illegal, Unreported and Unregulated (IUU) fishing and to mitigate human-crocodile conflict	H	0	1	2027	NDB
6. Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent, by 2030, eradicating or controlling invasive alien species especially in priority sites					MALFF, MTE, MTI (Customs Department)
6.1. Identify priority invasive species and pathways in critical sites and assess their impacts on ecosystems and biodiversity	M	0	1	2030	NDB /Customs Department
6.2. Develop and implement plans for prevention of identified new species and develop control or eradication measures for priority invasive species	M	0	1	2030	MTE/MALFF/Customs Department
6.3. Provide training to Customs Department staff on alien invasive species prevention, at least 30% women's participation, inclusive training arrangements, and awareness of gender-differentiated livelihood impacts	M	0	1	2030	NDB
7. Reduce chemical pollution and soil nutrients loss by 50%, including through integrated pest management, increase recycling of waste products, and substantially reduce marine and coastal plastic pollution by 2030					MALFF, MTE, Ministry of State Administration, Ministry of Public Works
7.1. Improve controls on import and sales of chemical pesticides and increase the use of biological controls and natural pesticides such as Neem, diatomaceous earth, and bacterial insecticides	H	0	1	2030	DNCP
7.2. Establish an environmental laboratory to conduct environmental testing (e.g., for hazardous substances in marine organisms), inspection, monitoring, and enforcement, making sure recruitment and training of women as lab technicians and inspectors and gender balance in technical staff appointments	H	0	1	2026-2030	DNCP
7.3. Develop extension programs on the use of alternative herbicides, insecticides	M	0	1	2030	DNCP/Agriculture

and natural fertilizers for communities					Department
7.4. Develop a system of deposit and collection for recycling to reverse the onus for plastic waste to the producers/sellers/importers/retailers rather than on the consumers, including women entrepreneurs in waste collection and recycling and promoting safe and equitable employment opportunities	H	0	2	2025 - 2030	DNCP
7.5. Work to improve 'Decree Law 14/2017 Customs Code' that currently has no articles or provisions directly preventing plastic pollution, including enforcement measures that clearly articulate how enforcement will be carried out	H	0	1	2025-2030	DNCP
7.6. Develop regional partnerships for recycling and development of regional plastic pollution elimination and recycling plans through international level collaborations, supporting women-led enterprises and addressing financial access barriers for women entrepreneurs	H	1	1	2025	DNCP
7.7. Create and strengthen policies or laws to prevent pollution in estuaries, beaches and at sea, and implement the "Zero Plastics Policy"	H	2	10	2026-2030	DNCP
7.8. Raise community awareness of how to 'Reduce, Reuse, and Recycle' by organizing Communication, Education and Public Awareness (CEPA) campaigns by engaging women and youth groups	H	2	5	2026-2030	Dirasaun Nacional Controlu Pollusaun (DNCP)
8. Continue to minimize the ongoing impacts of climate change and ocean acidification on biodiversity and increase ecosystem resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solutions and/or ecosystem-based approaches					MALFF, MTE
8.1. Conduct integrated climate vulnerability assessments and develop integrated climate adaptation plans for Ministries and departments including forests, agriculture, environment to minimize climate change impacts, ensuring women's participation in adaptation consultations (at least 50% in rural areas), integration of gender-disaggregated vulnerability data, and strengthened institutional capacity to collect sex-disaggregated environmental data (Ongoing programme) and continue with second phase of assessments at the village level	**H**	1	1	2026	MTE/National Directorate for Climate Change
8.2. Continue reforestation as both mitigation and adaptation to climate change, including reforesting degraded river valleys and other areas requiring soil protection (Ongoing MALFF programme and see Action 4)	**H**	1	2	2025-2030	MALFF
8.3. Research, produce, and provide seeds for key crops (maize, rice, pulses) adapted to a drier, warmer climate to communities to improve agricultural outputs, including by conserving local varieties to avoid genetic erosion (Ongoing MALFF programme)	**H**	1	2	2025-2030	MALFF /Seeds for Life
8.4. Conduct carbon farming projects using ecosystem-based approaches to improve landscape connectivity, restore heterogeneous forests, recover mangroves, wetlands, grassland, seagrass meadows, and taking into account conservation and restoring biodiversity by adopting Blue Economy principles (learning can be obtained from an ongoing project for carbon farming and funded by the EU and implemented by World Vision and carbon offset Timor Foundation (FCOTI)	**M**	**0**	1	2030	MTE/MALFF

8.5. Integrate and mainstream biodiversity and climate change into national and sectoral plans and establish cross-ministerial coordination platform	**M**	**0**	**1**	2028	MALFF
9. By 2030, ensure the sustainable management and use of wild species and other biological resources in Timor-Leste to deliver equitable social and economic benefits for local communities, especially those most dependent on biodiversity, through sustainable biodiversity-based livelihoods, while safeguarding customary practices and traditional knowledge					**MALFF**
9.1. Expand sustainable wild species-based livelihoods (terrestrial, marine/coastal, and freshwater), including small-scale fisheries, sustainable harvest, agroforestry, aquaculture, ecotourism, and non-timber forest products (NTFPs) using Nature-based Solutions (NbS) approaches	**H**	**0**	5	2028	MTE
9.2. Establish and strengthen sustainable wild species-based value chains to promote ecotourism, small and medium-sized enterprises, women-led entrepreneurship, and the circular economy, thus contributing to local economy and livelihoods	**H**	0	5	2028	NDB
9.3. Establish transparent benefit-sharing systems for income and non-monetary benefits derived from wild species and other biological resources (e.g., fisheries, ecotourism, conservation agreements, PES), ensuring women, youth, and vulnerable groups have equal access to wild species-based livelihood opportunities, training, leadership, and benefit-sharing	**M**	0	1	2027	NDB
9.4. Formally recognize and support customary rules and traditional knowledge for sustainable wild species use and management, including community governance in LMMAs, community forests, and inland waters.	**H**	0	1	2027	NDB
9.5. Monitor and report the social and economic benefits from sustainable wild species use (land, marine, and freshwater) within national and municipal plans, budgets, and the NBSAP M&E system	**M**	0	1	2026-2030	NDB
10. By 2030, ensure the sustainable management of forests, fisheries, agriculture, aquaculture, and wildlife in Timor-Leste by promoting ecosystem-based practices, strengthening enforcement, and supporting community-based livelihoods to safeguard biodiversity and ecosystem services					MALFF
Forestry					
10.1. Document and promote traditional knowledge, techniques, and practices for the conservation and sustainable use of biodiversity, including *tara bandu* system	H	1	1	2025	MTE
10.2. Promote agroforestry, high value tree planting, elephant grass, and bamboo plantationsin at least 4 municipalities as a mechanism to improve livelihoods and promote sustainable management of the surrounding natural forest, in part through community forestry (Ongoing project through JICA; recent EU project completed)	H	0	4	2025	MALFF /JICA/EU
10.3. Develop management plans to enable sustainable forest management in all municipalities	H	0	1	2030	MALFF
10.4. Increase enforcement to reduce illegal logging, including through training of officers	H	1	3	2026-2030	MALFF

10.5. Continue to develop and improve the Aileo Municipal Botanical Garden to protect tree species and as a tourist destination (Ongoing MALFF programme)	H	0	1	2025-2028	MALFF
10.6. Establish community-based nurseries especially for high-value timber trees, focusing on native tree species, and involve local communities in reforestation/planting activities, promoting women's leadership in nursery management and decision-making and equitable participation in benefit-sharing	H	4	10	2026-2030	MALFF
Fisheries					
10.7. Finalize and implement the fisheries strategic action plan and National Ballast Water Management Strategy, promote sustainable fishing including for the offshore fishery, and draft the Blue Economy Policy, revisiting the draft National Ocean Policy (Ongoing MALFF programme)	H	0	1	2025-2028	MTE/ MALFF
10.8. Promote campaigns at fishing communities for fishing techniques that reduce risk of depleting fish production capacity, including by defining open and closed areas through increased LMMAs (Ongoing MALFF programme with WorldFish and Blue Ventures)	H	0	2	2025-2027	MALFF /BV/WF
10.9. Establish and implement Integrated Coastal Management (ICM) programmes focusing on sustainable livelihood development, including sustainable fishery management with support to the artisanal fishery sector (learning from PEMSEA can be replicated)	M	2	3	2028-2030	DN Aquaculture/ MALFF
10.10. Enhance fishery production quality and improve distribution of sustainable fisheries production, including developing fisheries production quality standards	M	4	6	2030	Dirasaun nacional peskas
10.11. Support the creation of financial institutions to provide small and rotating loans for fishermen and fish-farming communities (Possible collaboration with FAO for this action.)	M	3	3	2030	MALFF
10.12. Transform Maubara National Institute of Fisheries and Aquaculture into an integrated center for Fisheries and Aquaculture Research development and capacity building, which includes an educational and a fishery monitoring component	M	1	1	2030	Dirasaun nasional aquiculture
10.13. Establish a National Centre for Cetacean Regulation, Research, and Control (cf. Target 4)	L	0	1	2030	MALFF
10.14. Improved maritime enforcement, including through the use of satellite technology	H	0	1	2026-2030	MALFF
Aquaculture					
10.15. Improve the fish hatcheries by providing improved equipment ensuring sustainable production	M	6	8	2030	DN AQUACULTURE
10.16. Provide support to 2,565 freshwater aquaculture families, 2,820 marine aquaculture families and 172 salt farming aquaculture families for sustainable production and harvest (Ongoing activity, so expand it)	M	3	3	2030	DN AQUACULTURE
10.17. Train 100 aquaculture families with new technology applicable to the cultivation and sustainable harvest of freshwater, brackish, and marine fish	M	0	1	2030	DN AQUACULTURE

10.18. Establish aquaculture groups or associations to multiply certified and commercial fingerlings	H	0	1	2027-2030	MALFF
10.19. Establish new fish feed production centres (Has been built or established 6 and potentially to have another 2 in Baucau and Covalima)	M	0	1	2026-2030	MALFF
Agriculture					
10.20. Introduce and promote appropriate and biodiversity-friendly improved farming practices to increase production in agricultural lands, including alley cropping, crop rotation, terracing, reducing slash and burn practices, and using climate-ready high-yield seeds, ensuring at least 50% women beneficiaries, support to at least 30% young women in horticulture and fruiticulture, and promotion of women's leadership in agricultural decision-making (Ongoing MALFF Programme).	H	1	2	2026	MALFF
10.21. Improved livestock management and sustainable grazing to reduce the risk and impact of overgrazing from livestock	H	0	1	2027	MALFF
10.22. Continue to diversify types of products and develop alternatives to subsistence agriculture through the Seeds of Life Programme and research programmes at MALFF (Ongoing by MALFF)	M	0	1	2030	MALFF
10.23. Establish gene banks and community seed banks to ensure sustainable supply of seeds of native crop varieties (Ongoing MALFF Programme).	H	1	2	2030	MALFF
10.24. Provide subsidies to farmers who use sustainable techniques to improve crop production	H	0	1	2030	MALFF
10.25. Conduct research, development, and dissemination of seeds for specific crop varieties to improve crop yields on less land including through proper zonation of lands for crop types. (Ongoing MALFF Programme).	H	1	2	2030	MALFF
10.26. Map agro-ecological zones (ongoing)	M	0	1	2030	MALFF
Wildlife					
See Target 5					
11. By 2030, restore ecosystem services on 20% of degraded areas using ecosystem-based approaches such as watershed and coastal restoration, integrated water management, and payment for ecosystem services					MALFF, MTE
11.1. Develop educational materials for educating school children about the important relationship among biodiversity conservation, ecosystem services, and human health	H	0	1	2030	MTE
11.2. Develop and implement an Integrated Water Management Plan, involving key concerned sectors (forestry, infrastructure, water management authorities) to address pollution and sedimentation	H	1	2	2030	MALFF
11.3. Monitor pollution/water quality, sedimentation of rivers, soil erosion and implement restoration activities to prevent siltation (see Target 7) (an ongoing activity done by BTL)	H	1	1	2025	BTL
11.4. Develop water quality standards and establish a water quality laboratory, including recruitment and training of women as lab technicians and water	H	1	1	2025	BTL

monitoring specialists and adoption of gender-inclusive workplace policies					
11.5. Develop and implement a payment for ecosystem services (PES) scheme for water and forest resources	H	0	1	2028-2030	MALFF
11.6. Continue recovery of degraded lands, especially along river valleys and coastal areas, including 15 watershed plans completed (see Target 2) (Ongoing MALFF Programme)	H	0	1	2025	MALFF
11.7. Promote and develop the commercial production of seaweed as an alternative livelihood (Ongoing activity, and seaweed has been exported to Korea, China and Indonesia)	H	2	5	2026-2030	MALFF
12. Significantly increase the area, quality, and connectivity of, and benefits from, green and blue spaces in Dili, Baucau, and other municipalities, and ensure that biodiversity is considered in urban and other municipal planning by 2030					Ministry(ies): Ministry of State Administration, Ministry of Public Works
12.1. Improve and rehabilitate the waterfront and shoreline in Dili	H	1	2	2030	MPW
12.2. Improve co-operation among the Environment Department, the Ministry of State Administration, and the Ministry of Public Works for the restoration and creation of gardens and green spaces in Dili, Baucau, and other municipalities, with women's participation in municipal decision-making and employment in nursery, park, and garden maintenance programmes	M	1	2	2030	MPW
12.3. Develop and expand green spaces for citizens, with recreational trails to improve biodiversity, greenery and human health	M	1	4	2030	MPW
12.4. Implement 'Green List' of protected and conserved area pathway, with women's representation in site governance and assessment teams and integration of gender-responsive governance criteria	M	0	1	2028	MPW
13. By 2030, complete accession to and fully implement the Nagoya Protocol to promote benefit-sharing mechanisms for the use of genetic resources and traditional knowledge					MTE
13.1. Complete the accession process (Ongoing Dept. of Environment Programme)	**H**	**0**	**1**	2026 -2030	National Directorate for Biodiversity
13.2. Conduct an awareness-raising programme for policymakers, government and non-government stakeholders, including private sectors and communities to understand the Nagoya Protocol and why its implementation is important to Timor-Leste (ABS)	**H**	**0**	**4**	2026 -2030	National Directorate for Biodiversity
14. Government integrates conservation and sustainable use of biodiversity into all sectoral management and development policies, plans, and processes, considers a national accounting for ecosystem services, and ensures that EIAs are conducted for all proposed developments by 2030					All ministries
14.1. Form a national-level government-wide environment committee with a mandate to consider cross-cutting issues related to development, including issues such as biodiversity, climate change, gender, tourism, capacity-building and education, and human health	H	0	1	2025	ANLA/MTE

14.2. Continued implementation of the Environmental Licensing programme for any new developments, as a prerequisite for approval (National Decree No.5/Feb 2011), including training of women environmental officers in EIA review and gender balance in field inspection teams (Ongoing Programme)	H	1	2	2025	ANLA/MTE
14.3. Improve the system for obtaining Environmental Licensing to make the process more transparent to the public, including with public consultation for major development projects and respecting the rights of local communities (Ongoing activity)	H	1	1	2026	ANLA/MTE
14.4. Improve coordination and communication with petroleum authorities and mining authorities to only provide environmental licenses to companies with environmental protection built into the permit, and after an EIA has been completed (coordination with National Environment Agency)	H	1	1	2026	ANLA/MTE
14.5. Review and, as relevant, update existing agricultural policies, plans and processes, to integrate biodiversity and its multiple values, including sustainable tourism	H	1	1	2026	MALFF
15. Establish a pilot programme with 5 businesses to report on their impacts on biodiversity and to develop mechanisms to mitigate these impacts, providing information to consumers on how to reduce waste by 2030. Such programmes could include working with the banking sector (e.g., Banco Nacional de Comercio de Timor-Leste), the oil and gas sector, the shipping sector, and coffee producers (e.g., Timor Global LDA, Café Timor). This target would benefit from the process outlined by the Science-Based Targets Network[31], as well as the BIOFIN documents[32]					MTE, Ministry of Trade and Industry
15.1. Select 5 businesses and negotiate terms of an agreement for reporting on risk to and possible impacts on biodiversity and the suitable indicators that will be required (first 3 years)	M	0	2	2030	MTE/NDB
15.2. Work with the 5 pilot companies to develop mitigation planning to reduce impacts on biodiversity (final 4years), including women employees in CSR planning and participation of women in environmental auditing teams	H	0	1	2030	MTE/NDB
16. By 2030, promote sustainable consumption and waste management through education and policy, legislative or regulatory framework for integrated waste management, recycling, and composting initiatives					MALFF, MTE, Ministry of Education, Ministry of Health
16.1. Continue to strengthen plastic management policies by improving plastic import rules	H	0	1	2027	MTE/MSA
16.2. Promote and practice integrated waste management and establish waste banks under the municipality authorities' jurisdiction	H	0	1	2027	MTE/MSA
16.3. Develop and implement elementary and secondary school waste awareness programme and provide information brochures to libraries, involving female	H	0	1	2027	MTE/ME/MSA

[31] https://sciencebasedtargetsnetwork.org/take-action-now/take-action-as-a-company/what-you-can-do-now/

[32] See: www.biofin.org

teachers and students and promoting girls' leadership in eco clubs					
16.4. Develop a public composting system through organic collections from restaurants and other businesses and promote the use of the compost in agricultural areas, including women farmers and waste workers and ensuring equal access to compost-use benefits	H	0	1	2027	MALFF/MTE
17. Strengthen capacity for and implement biosafety measures as outlined in Article 8(g) of the CBD, as well as measures for the handling of biotechnology and distribution of its benefits, as set out in Article 19, aligning with the Cartagena Protocol					MALFF, MTE, Ministry of Trade and Industry
17.1. Increase the capacity of ministry staff relevant to safe food identification of foods contain genetic modifications and additive materials that are regulated by health standards	M	0	1	2030	MALFF/MTE
17.2. Strengthen facilities and train human resources for biosecurity	M	0	1	2030	MTE/NDB
17.3. Increase staff capacity for the identification and quarantine of new animals and crops	H	0	1	2026-2027	MTE/NDB
17.4. Strengthen facilities in quarantine services to implement the Protocol, standards, and database for sanitary and phytosanitary controls to facilitate the import and export of agricultural products, while ensuring the interoperability of a Single Window system	M	0	1	2027-2030	MTE/NDB
18. Identify by 2027 and progressively phase out or reform incentives harmful to biodiversity, starting with the most harmful incentives, and seek out possibilities to implement positive incentives for the conservation and sustainable use of biodiversity					MALFF, MTE, Ministry of Trade and Industry
18.1. Establish a mechanism for all relevant ministries to indicate and report subsidy programmes to the Environment Department for the relevant National Reports to the CBD and to assess impacts of these subsidies on target and non-target biodiversity, ensuring gender balance in scientific and inspection teams	H	0	1	2027	MTE/NDB
18.2. Conduct research to determine non-target impacts on biodiversity to facilitate implementation of subsidy programmes, ensuring women officers receive equal technical training and safe, inclusive working conditions	H	0	1	2026	MTE/NDB
18.3. Develop mechanisms and integrate into policies to mitigate subsidies and incentives found to have unexpected or negative consequences on biodiversity	H	0	1	2026	NDB
18.4. Integrate mechanisms and plans to promote positive incentives to reduce use of natural resources	H	0	1	2026	NDB
19. Continue to work with multiple donors and aid/development agencies, including NGOs and the private sector, to increase funding to conserve and manage biodiversity, and for the government to increase relevant agency budgets by at least 15% through building recognition for the importance of conserving biodiversity by 2030					MALFF, MTE
19.1. Continue taking appropriate initiatives to attract investments from donors including GEF, GCF, etc., and regional funds, and encourage private sector	H	2	3	2025-2030	MTE

	investments specifically for biodiversity (Ongoing)					
19.2.	Establish biodiversity fund to promote protection and needed information (data) on biodiversity and establish cross-ministerial coordination platform, confirming women's participation in fund governance and use of gender-responsive funding criteria	H	0	1	2026-2030	MTE
19.3.	Continue to work diligently with existing UN agencies and donor country partnerships to conserve biodiversity, while carefully assessing donor self-interest vs. what is required in Timor-Leste (Ongoing)	H	5	8	2025-2030	MTE
19.4.	Develop a law and promote the carbon market, specially voluntary carbon market and Internationally Transferrable Mitigation Outcome (ITMO) to facilitate community groups to engage in planting trees, securing women's equal access to carbon payments and benefit sharing	M	0	1	2030	MTE/NDCC
19.5.	Develop and facilitate community-based fund-raising options (e.g. eco-tourism and introducing tourist tax to fund conservation programmes) to make communities self-sustained in financing biodiversity conservation efforts, ensuring women's participation in fund management and gender-responsive benefit-sharing mechanisms	H	0	1		MTE
19.6.	Ensure implementing agencies (UNDP, FAO, UNEP and etc.) implement programmes that enable data collection, collect and use local knowledge with respect, and that innovations are accessible to the communities (Ongoing)	H	0	1	2025	MTE
19.7.	Develop a BIOFIN plan by 2026 (Already initiated in support of UNDP)	H	0	1	2026	MTE/NDB/UNDP
20.	**Continue to facilitate and encourage South-South, North-South, and triangular cooperation to increase capacity and technological skills development of government and university staff, while increasing the understanding of Timor-Leste's biodiversity and ecosystem functioning**					MALFF, MTE
20.1.	Assess the needs for capacity building, and to recommend solutions, propose actions, and identify mechanisms to address the identified capacity needs, and gaps in collaboration of the national environmental committee (if established - see Target 13) and other stakeholders	H	1	2	2026-2027	MTE/NDB
20.2.	Develop joint programmes with relevant sectors for funding from tender partners (DFAT, JICA, KOICA, AFoCO, etc.) and multilateral (GEF, GCF) adaptation funds, etc. (Ongoing)	H	0	1	2026-2030	MTE/NDB
20.3.	Create an inter-ministerial commission to produce and share information to ensure gender parity in commission membership and inclusion of women experts in data governance discussions	H	1	1	2027	MTE/NDB
20.4.	Establish links or partnerships with regional organisations and interested universities in the Asia region, and improve existing partnerships (e.g., by inviting SPREP to assist in specific marine monitoring programmes) ensuring gender balance and inclusion of women scientists as lead authors or project coordinators (Ongoing)	M	1	2	2027	MTE
20.5.	Ensure that projects from development banks include a strong component to	H	0	1	2026-2030	NDB

sustainably use and protect biodiversity (Ongoing)					
21. By 2030, establish and operationalize a national biodiversity monitoring and database system that integrates scientific research, community-based monitoring, and traditional knowledge to provide baselines, track trends, and inform evidence-based conservation decisions					MALFF, MTE
21.1. Formulate an interdepartmental environment committee (see Target 13, Action 1) to oversee and support national biodiversity database management (National Biodiversity Information Facility) that uses standardised monitoring protocols and data format	H	0	1	2030	NDB
21.2. Strengthen and develop human resources for biodiversity monitoring through workshops and training abroad, as well as through technology transfer from donor agency projects, making sure gender parity among participants and access to mentorship for women in biodiversity monitoring	H	1	2	2030	MTE
21.3. Conduct a comparative study of data collection methods and indicators in other small island developing states to develop tailor-made strategy for Timor-Leste	H	0	2	2030	MTE
21.4. Develop clear NBSAP monitoring obligations and enforce this across the departments	H	0	2	2026	NDB
21.5. Acquire and employ traditional knowledge from local communities, at pilot sites, using both oral history and developing community-based sampling for biodiversity and habitats	L	0	1	2030	NDB
21.6. Ensure that all aid and government projects have a built-in monitoring component that uses indices listed in this NBSAP	H	0	1	2027	NDB
21.7. Launch a National Biodiversity Baseline and Monitoring Programme and continue strengthen it through appropriate data and integrate this into nutrition-sensitive policies and community management of inland waters	H	0	1	2026	NDB
21.8. Collate data and feed into a biodiversity database and portals using rapid biodiversity assessments and link this with CHM with inclusion of women in data entry, management, and analysis roles	H	0	1	2026-2030	NDB
21.9. Conduct characterization, assessment and monitoring of biodiversity, , including freshwater biodiversity, for food and agriculture by engaging women and marginalized communities and private sector actors, integrating traditional knowledge of women and marginalized groups and ensuring equitable access to capacity-building and benefits	M	0	1	2026	NDB
22. Ensure that women, people with disabilities, and other marginalized groups are represented and have equal participation in decision-making related to biodiversity and land management, and that they have equal rights and access to land and natural resources					MALFF, MTE
22.1. Ensure that projects enable input from all members of involved communities, with a special emphasis to safeguard participation by women, people with disabilities, other minorities and youth (Ongoing)	**H**	0	1	**2026**	MTE/NDB
22.2. Ensure that the interdepartmental environmental committee is gender, youth	**H**	0	1	**2026**	MTE/NDB

and other minority balanced, to the extent possible					
22.3. Invite environmental defenders to share their concerns and feedback on any development project and policy and strategy development efforts (Ongoing)	**H**	1	2	**2026**	MTE
22.4. Ensure all new projects will have a component ensuring attention to gender and minority issues (Ongoing)	**H**	0	1	**2026**	MTE
22.5. Strengthen the legal recognition of tenure rights for local communities with customary tenure systems	**H**	**0**	**1**	**2028**	**MTE**

Annex 7. Capacity building and gender considerations in NBSAP

Targets and Actions	Training and Capacity Need Assessment	Gender focused Key Consideration
1. By 2030, ensure that all areas are under integrated, biodiversity-inclusive spatial planning and effective management to address changes in land and sea use, particularly by reducing the loss of areas of high biodiversity importance and ecosystems with high ecological integrity, while respecting the rights of local communities.		
1.1. Develop maps of ecosystem integrity, forest connectivity, biodiversity hotspots, as well as priority degraded areas for targeted spatial planning to improve ecological connectivity by integrating gender-disaggregated data on land tenure security, access to natural resources and technologies (ongoing)	• Training on GIS and remote sensing for mapping ecosystem integrity and degradation • Capacity building on biodiversity data collection, analysis, and metadata management • Technical training on the use of spatial planning software (ArcGIS, QGIS)	• Ensure women, youth, and local community participate in identifying biodiversity priority areas • Integrate gender disaggregated data into mapping and spatial analysis.
1.2. Develop and implement land, coastal, and sea conservation and use plans using integrated and landscape approaches to reduce negative impacts on biodiversity with gender-balanced participation in planning and decision-making bodies and a minimum of 30% women in consultations (ongoing: ATSEA Project; PEMSEA)	• Training for national and municipal planners on integrated land–sea use planning • Institutional capacity building on coordination among the land, fisheries, and environment sectors • Workshops on legal and policy integration for spatial planning	• Involve women, fishers, and local communities in participatory spatial planning • Ensure their access to information and consultation processes
1.3. Develop and implement Marine Spatial Planning within the framework of the 'Blue Economy' to ensure a clean, healthy, productive and biologically diverse marine area (Ongoing: ATSEA Project; PEMSEA)	• Capacity building on Marine Spatial Planning (MSP) methodologies and Blue Economy principles • Technical training for DMCA, Fisheries, and Maritime agencies on data analysis and marine zoning tools • Policy dialogue facilitation skills for inter-ministerial coordination	• Promote women's leadership in marine resource governance • Ensure equitable benefits from blue economy initiatives
1.4. Develop a possible partnership with UNESCAP/UNESCO and other relevant organizations for the remote sensing of landscapes to assist in spatial planning and populating indicators of connectedness	• Training on remote sensing data interpretation and analysis • Building institutional capacity to integrate satellite data into spatial decision-making • Technical cooperation on monitoring landscape connectivity	• Include local female technicians in capacity building for GIS and remote sensing applications

2. By 2030, degraded areas of forests, agricultural lands, inland waters, and coastal and marine areas are mapped and 20% are restored to improve biodiversity, connectivity, and ecosystem integrity.		
2.1. Develop a revised forest cover and degraded areas map and complete the mapping of degraded coastal and marine areas	• Training on GIS, remote sensing, and forest degradation mapping • Capacity building for MALFF, NDFA, and municipal staff on data management • Skills development on integrating terrestrial and coastal data layers	• Ensure data collection teams include women and youth • Integrate gender differentiated information on resource use and degradation
2.2. Plant 1 million trees per year (>600 ha/year) in priority degraded sites including in deforested watersheds, to increase landscape connectivity and habitat quality, ensuring at least 30% women's participation among labourers (Ongoing MALFF programme)	• Training on nursery management, native species propagation, and maintenance • Community-based reforestation training focusing on climate-resilient species • Monitoring and reporting training for forest rangers	• Engage women's groups and youth associations in tree nurseries, planting, and maintenance for livelihood generation
2.3. Recover 200 ha of mangrove forest annually and promote community-led conservation and mangrove stewardship by adopting public-private partnerships	• Training on mangrove planting, monitoring, and ecosystem restoration • Capacity building on community-based coastal resource management • Technical guidance on species selection and hydrological restoration	• Support women's cooperatives in mangrove restoration, emphasizing sustainable use of mangrove resources for income diversification
2.4. Complete restoration planning in Ninura River, and Mota-Masin River Basin with learning from Kamora River Basin (Ongoing MALFF programme)	• Training on integrated watershed management (IWM) and hydrological mapping • Capacity building for local government and community groups on watershed planning • Technical assistance on nature-based watershed restoration practices	• Involve women farmers and water user groups in watershed planning and management to ensure equitable access to restored ecosystem benefits
2.5. Recover soil function through the expanded use of organic fertilisers and restore 500 ha of degraded farmland and wilderness	• Training on composting, biochar, and the use of organic fertilizers • Farmer Field School (FFS) on soil restoration and agroecology • Capacity building for agricultural extension workers	• Train women and youth farmers in organic fertilizer production and soil conservation techniques
3. By 2030, ensure at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, and		

integrated into wider landscapes and seascapes, while ensuring that sustainable uses are fully consistent with conservation outcomes, recognizing and respecting the rights of local communities.		
3.1. Finalize and implement the management plans and governance systems for all National Parks and 3 other protected areas in consultations with local communities (Ongoing MALFF programme)	• Training on protected area management planning and monitoring • Capacity building for park rangers, planners, and local managers • Training on biodiversity inventory, zoning, and enforcement tools	• Ensure women's involvement in park co-management committees • Provide employment and training for women in conservation and eco-tourism • Ensure gender equity in benefit sharing from park-related income
3.2. Continue working towards creating protected areas at Manatuto, Baucau, and Covalima following social and environmental impact assessments	• Training on legal designation processes and participatory mapping • Institutional strengthening of protected area governance • Awareness sessions on environmental and social safeguards	• Involve women and vulnerable groups in consultations and mapping • Address gender specific land tenure and access issues • Promote inclusion of women's ecological knowledge in planning
3.3. Continue efforts to create an International Marine Peace Park with Indonesia (Ongoing MALFF programme)	• Training on transboundary conservation and marine governance • Capacity building for negotiation and international coordination • Exchange programs for marine park staff	• Include women in cross border conservation initiatives • Ensure gender sensitive stakeholder engagement in coastal communities • Promote women's participation in transboundary marine tourism opportunities
3.4. Improve visitor services at Nino Konis National Park and at Kayrala Xanana Gusmao National Park to improve the attraction to tourists, in part through further training of local communities for park management	• Training on eco-tourism management, guiding, and hospitality • Capacity building for community enterprises in sustainable tourism • Training on safety and visitor interpretation	• Promote women led tourism enterprises; ensure safe and inclusive working conditions
3.5. Establish at least 10 new LMMAs and 300+ ha of new community forest, with 3 CF committees established (learning from Ulmera, Natarbora, Hera, Metinaro and Tasi Tolu community forests can be replicated)	• Training on LMMA and community forest management • Capacity building on sustainable harvesting, monitoring, and restoration • Community leadership training for both men and women	• Ensure gender balance in community forest committees and LMMA governance • Document and integrate women's traditional ecological knowledge
3.6. Assist LMMAS and CFs near PAs to achieve Asean CBT certification to encourage ecotourism, ensuring balanced participation of women and men in training, decision-making, and certification, and gender-responsive benefit-sharing mechanisms	• Training on ASEAN CBT standards, certification requirements, and compliance procedures for LMMAs and CFs • Capacity building on ecotourism product development and visitor management, including guiding, safety, environmental standards, and carrying capacity • Training on basic enterprise management, including financial record-keeping, pricing, marketing, and	• Ensure balanced participation of women and men in CBT training, decision-making, and certification processes • Support and prioritize women-led CBT activities (e.g. homestays, guiding, handicrafts, food services, cultural tourism) • Establish gender-responsive benefit-sharing mechanisms to ensure women and vulnerable groups equitably benefit from ecotourism revenues

	quality assurance for CBT operations	
3.7. Finalize the Atauro National Marine Park and conduct a biodiversity assessment to include mapping of coral reefs at the Park (Ongoing MALFF programme)	• Training on coral reef assessment, GIS reef mapping, and marine biodiversity monitoring • Technical support on marine park zoning and enforcement	• Involve women in marine biodiversity monitoring • Promote gender equality in decision making within Atauro's marine management committees • Support women's livelihoods in sustainable fisheries and ecotourism
3.8. Conduct connectivity and gap analyses, loss and gain assessment and biodiversity indices analysis of PAs and OECM	• Training on GIS and remote sensing for connectivity, gap, and land-use change analyses • Capacity building on biodiversity indicators and indices for PA and OECM assessment • Training on data analysis and reporting to support PA planning and monitoring	• Ensure equal access for women and men to technical monitoring training • Engage women and youth in community-based biodiversity monitoring • Apply gender-disaggregated data where community data are collected
3.9. Establish buffer zones and integrate small and adjacent PAs to improve connectivity	• Training on buffer zone design and ecological corridor planning • Capacity building on participatory land-use planning with communities and municipalities • Training on conflict-sensitive conservation planning	• Ensure women's participation in buffer zone planning and decisions • Integrate women's land-use knowledge into buffer zone design • Promote equitable livelihood opportunities in buffer zones
3.10. Establish a multi-stakeholder, gender-balanced, protection area management authority and community conservation committee for 47 identified locations, consisting of government, municipal authorities, and local community representatives	• Leadership and governance training for protected area committees • Institutional strengthening on multi -sectoral coordination • Training on conflict resolution and inclusive decision -making	• Ensure gender parity in management authority membership • Build leadership capacity of women in conservation governance • Promote inclusive participation in decision-making processes
3.11. Train PA staff in sustainably PA management and governance and monitoring performance and changes of PAs with time	• Training on sustainable PA management and governance • Capacity building on PA performance monitoring tools (e.g. METT) • Training on data management and reporting for adaptive management	• Ensure gender-balanced participation in PA training programmes • Strengthen leadership skills of women PA staff • Promote gender-responsive PA governance practices
3.12. Designate new marine PAs to reach to a total of 23 (currently 23 are the permanent PAs and 2 marine PAs)	• Training on MPA site identification, monitoring, and enforcement • Capacity building on marine ecosystem valuation and restoration • Technical support for MPA network design	• Encourage women's participation in MPA management • Promote gender-sensitive livelihood diversification for fishing communities Include women in monitoring and reporting activities
3.13. Complete a national strategy and action plan (e.g., tourist tax collection), along with Standard Operating Procedures (SOPs) and business plans on the sustainable development of protected areas	• Training on strategic planning, data analysis, and indicator development • Cross sectoral workshops on implementation and reporting mechanisms • Policy drafting and consultation facilitation skills	• Ensure women's involvement in strategy consultations and drafting • Integrate gender equality principles into the national PA strategy • Include gender sensitive monitoring indicators
3.14. Conduct biennial Protected Area Management	• Training on METT methodology, scoring, and	• Ensure women's participation in METT assessments

Effectiveness Tracking Tool (METT) to monitor change and aid adaptive management and link results-with performance-based funding, ensuring women's participation in METT assessments	documentation • Capacity building on data collection, analysis, and reporting of PA effectiveness results • Training on using METT results for adaptive management and funding decisions	and review processes • Apply gender-responsive indicators where relevant in PA effectiveness tracking • Promote inclusive consultation with women and community representatives during METT reviews
4. By 2030, threatened species and genetic diversity will be protected through the development of a formal process to list threatened species, develop prevention, management and recovery plans for endangered or critically endangered species through *in situ* and *ex situ* conservation and sustainable management practices of native, wild and domesticated species, and reduce human-wildlife conflicts		
4.1. Appoint a threatened species expert committee with a term of reference to (i) compile and examine the evidence for the status of possible threatened species and (ii) to propose species for protective listing to government based on the best available evidence	• Training on species assessment methodologies and IUCN Red List criteria • Capacity building on biodiversity data analysis and reporting • Technical guidance on monitoring endangered species	• Ensure gender balance in expert committee membership • Include female biologists and conservation practitioners • Promote recognition of women's traditional ecological knowledge in species protection
4.2. Develop and implement Monitoring and Recovery Plans for 10 priority endangered species, engaging women in field monitoring and community awareness activities, and promoting equitable benefit sharing	• Training on species recovery planning and implementation • Capacity building for field officers and NGOs in species management • Technical assistance on genetic diversity and population monitoring	• Engage women in field monitoring and community awareness programs • Include gender sensitive livelihood alternatives to reduce human–wildlife conflict • Promote equitable benefit sharing from conservation incentives
4.3. Determine the critical habitats for all species listed as threatened or endangered	• Training on habitat suitability mapping and spatial data analysis • Capacity building in ecological surveying and species–habitat modeling • Field based training on data collection and GPS mapping	• Include women in field survey teams and local validation workshops • Address gender specific access to biodiversity information • Recognize women's role in identifying culturally important species and habitats
4.4. Capture 100% of the critical habitats for terrestrial threatened species and 50% of the habitat of marine threatened species in at least one protected area (Ongoing MALFF programme)	• Training on integrating species and habitat data into protected area planning • Capacity development for enforcement and monitoring staff • Knowledge exchange with regional conservation networks	• Ensure women's inclusion in habitat protection and co management • Support women-led conservation initiatives in coastal areas • Assess gendered dependence on natural resources within critical habitats
4.5. Improve enforcement of existing regulations to protect threatened species by hiring and training additional staff, recruiting and training women as enforcement officers and ensuring gender-	• Training on wildlife law enforcement, patrol techniques, and evidence collection • Capacity building on CITES and biodiversity law implementation	• Recruit and train women as wildlife officers and enforcement staff • Provide gender sensitive workplace policies and training

sensitive workplace policies and safety measures	• Cross agency coordination training for MALFF, customs, and police	• Address safety and inclusion of women in field enforcement teams
4.6. Establish a National Centre for Cetacean Regulation, Research, and Control. (cf. Target 10)	• Training on marine mammal monitoring and stranding response • Capacity building on cetacean ecology, data analysis, and conservation policy • Equipment and laboratory training for marine biodiversity staff	• Ensure gender balance among researchers and technical staff • Promote women's participation in marine science and conservation • Integrate gender sensitive community outreach on cetacean protection
4.7. Develop strategy for maintaining and restoring the genetic diversity of native, wild and domesticated species *in situ*	• Training on genetic diversity conservation concepts, in situ management, and population monitoring • Capacity building on integrating genetic diversity into species recovery, habitat management, and land-use planning • Training on community-based conservation practices that support maintenance of local crop, livestock, and wild species diversity	• Recognize and support women's roles in maintaining traditional crop varieties, livestock breeds, and wild species knowledge • Ensure women's participation in strategy development and community consultations • Promote equitable access for women and men to training, decision-making, and benefit-sharing related to genetic resources
4.8. Strengthen the national genebank through advanced management tools and techniques in regeneration, multiplication and maintenance *ex situ*	• Training on genebank management, seed storage, regeneration, and quality control techniques • Capacity building on documentation systems, databases, and genetic material tracking • Training on ex situ conservation protocols aligned with national and international standards	• Promote gender balance among genebank technical and management staff • Support capacity development of women scientists and technicians in seed and genetic resource management • Ensure gender-sensitive policies in staffing, training, and career advancement within genebank institutions
5. Management plans are being completed and implemented for commonly harvested wildlife species (marine and terrestrial), with a focus on those that are being over-exploited and commercially traded, through direct consultation with local communities by 2030		
5.1. Provide training, develop data, and an understanding of which species are hunted/fished, the rates of harvesting of each species, and which species are declining in collaboration of communities, ensuring gender-balanced participation (minimum 30% women) and inclusion of women's traditional knowledge and gender-specific roles in resource use	• Training on participatory biodiversity monitoring and data collection • Capacity building for local fishers and hunters on sustainable harvest practices • Training on species identification and record keeping	• Ensure equal participation of men and women in data collection and assessment • Recognize gender -specific roles in hunting, fishing, and postharvest processes • Include women's traditional knowledge in identifying resource use changes
5.2. Develop mechanisms and increase enforcement to reduce harvests of over-exploited species, including through the use of *Tara Bandu*, and closed areas in collaboration of LMMAs and CFs promoting alternative livelihoods that address	• Training on sustainable harvest limits, quota setting, and adaptive management • Capacity development for LMMA and CF committees on co-management practices • Technical assistance on monitoring and enforcement	• Ensure women's inclusion in LMMA/CF decision-making committees • Promote alternative livelihoods for women affected by reduced harvests • Address gender-specific dependence on marine and

gender-specific dependence on marine and forest resources (Ongoing MALFF programme, with WorldFish and Blue Ventures)	tools	forest products
5.3. Conduct inclusive stakeholder consultation/socialization in formulation and awareness creation on the National Biodiversity Law/Decree and Wildlife Conservation Law	• Training on environmental law, policy drafting, and stakeholder consultation • Capacity building for local leaders on biodiversity legal frameworks • Facilitation skills for inclusive and transparent law consultation	• Ensure women's equal participation in all law consultations • Use accessible formats and languages for women's engagement • Reflect gender equality provisions in revised biodiversity and wildlife laws
5.4. Build Crocodile Management Parks, increasing beach safety while conserving the species and promoting the tourist attraction of an animal that is a formal symbolic representation of Timorese identity	• Training on crocodile behavior, handling, and conflict mitigation • Capacity development on eco-tourism operations and safety management • Technical training on park design, visitor management, and conservation education	• Engage women in tourism management and conservation awareness roles • Provide livelihood opportunities for women in tourism and hospitality services • Ensure Park safety and facilities are inclusive for women and families
5.5. Develop policies, action plans, and legal frameworks for the management of selected wild species harvested for local economy and livelihood using ecosystem approach	• Training on species management planning and adaptive management frameworks • Capacity building for MALFF, NGOs, and communities on sustainable use • Technical guidance on integrating socioeconomic and ecological data	• Include gender analysis in harvested species management planning • Ensure women's access to decision making and benefit sharing mechanisms • Promote women's role in monitoring and sustainable resource use initiatives
5.6. Develop legislation and monitoring, control and surveillance systems to combat Illegal, Unreported and Unregulated (IUU) fishing and to mitigate human-crocodile conflict	• Training on IUU fishing legislation, compliance procedures, and enforcement protocols • Capacity building on monitoring, control and surveillance (MCS) systems, including vessel monitoring, reporting, and inspections • Training on human–crocodile conflict mitigation, incident response, and community awareness approaches	• Promote women's participation in fisheries monitoring, data collection, and community surveillance activities • Ensure gender-sensitive community engagement in IUU prevention and human–crocodile conflict mitigation • Provide safe and inclusive roles for women in reporting, awareness, and conflict response mechanisms
6. Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent, by 2030, eradicating or controlling invasive alien species especially in priority sites		
6.1. Identify priority invasive species and pathways in	• Training on invasive species identification, survey	• Involve both men and women in field surveys and

critical sites and assess their impacts on ecosystems and biodiversity	methods, and risk assessment • Capacity building for MALFF, border, and quarantine staff • Technical support on GIS mapping and risk pathway analysis	awareness campaigns • Integrate women's local ecological knowledge on new or invasive species • Ensure women's participation in decision making on biosecurity management
6.2. Develop and implement plans for prevention of new species and develop control or eradication measures for priority invasive species	• Training on eradication, containment, and ecosystem restoration techniques • Capacity development for environmental officers and local communities • Technical guidance on safe and environmentally sound control methods	• Provide equal opportunities for women in restoration and eradication programs • Promote women- led community initiatives in invasive species management • Ensure control measures consider gendered impacts on livelihoods and workloads
6.3. Provide training to Customs Department staff on alien invasive species prevention, at least 30% women's participation, inclusive training arrangements, and awareness of gender-differentiated livelihood impacts	• Training on border inspection procedures, risk identification, and quarantine systems • Capacity building for inter-agency coordination (Customs, MALFF, Fisheries) • Development of training manuals and standard operating procedures (SOPs)	• Encourage inclusion of women in Customs and quarantine inspection roles • Ensure gender-sensitive workplace training schedules and policies • Promote awareness of how invasive species affect women's livelihoods (e.g., farming, fishing)
7. Reduce chemical pollution and soil nutrients loss by 50%, including through integrated pest management, increase recycling of waste products, and substantially reduce marine and coastal plastic pollution by 2030		
7.1. Improve controls on import and sales of chemical pesticides and increase the use of biological controls and natural pesticides such as Neem, diatomaceous earth, and bacterial insecticides	• Training on integrated pest management (IPM), safe handling of agrochemicals, and promotion of organic pest control for MALFF Agriculture Directorate, municipal agriculture offices, farmer cooperatives, agricultural extension officers, and local farmer groups	• Ensure women farmers are trained on organic alternatives • Promote women-led organic farming cooperatives • Address women's exposure risks from pesticide use
7.2. Establish an environmental laboratory to conduct environmental testing (e.g., for hazardous substances in marine organisms), inspection, monitoring, and enforcement, making sure recruitment and training of women as lab technicians and inspectors and gender balance in technical staff appointments	• Technical training on pollution testing, chemical analysis, data management, and quality assurance for MALFF Environmental Directorate, National Laboratory staff, NDFA, and university science departments	• Recruit and train women as lab technicians and inspectors • Encourage girls in STEM education related to environment • Maintain gender balance in technical staff appointments
7.3. Develop extension programs on the use of alternative herbicides, insecticides and natural fertilizers for communities	• Capacity building on composting, organic fertilizers, and integrated nutrient management for MALFF Extension Division, NGOs (e.g., RAEBIA, HASATIL), community farmer field schools, and youth agricultural groups	• Include women farmers in all training and demonstration plots • Promote women as lead farmers in sustainable agriculture • Provide childcare or flexible schedules for women participants

7.4. Develop a system of deposit and collection for recycling to reverse the onus for plastic waste to the producers/sellers/importers/retailers rather than on the consumers, including women entrepreneurs in waste collection and recycling and promoting safe and equitable employment opportunities	• Training on EPR systems, waste value chains, and recycling logistics for Ministry of Commerce and Industry, Municipal Waste Units, private sector producers, recycling cooperatives, and NGOs	• Include women entrepreneurs in waste collection and recycling • Promote equitable income opportunities for women • Ensure occupational safety and fair wages in waste management
7.5. Work to improve 'Decree Law 14/2017 Customs Code' that currently has no articles or provisions directly preventing plastic pollution, including enforcement measures that clearly articulate how enforcement will be carried out	• Training on import control procedures, hazardous materials classification, and enforcement coordination for Customs Authority, MALFF Inspectorate, Ministry of Finance, and border officers	• Recruit women into customs inspection roles • Provide gender-sensitive working conditions • Recognize gender impacts of trade policy enforcement
7.6. Develop regional partnerships for recycling and development of regional plastic pollution elimination and recycling plans through international level collaborations, supporting women-led enterprises and addressing financial access barriers for women entrepreneurs	• Training on circular economy principles, cross-border recycling coordination, and private sector partnership facilitation for MALFF, Ministry of State Administration, municipal waste departments, ASEAN partners, and private recyclers	• Encourage women-led enterprises in recycling • Equal job opportunities in green industries • Address financial access barriers for women entrepreneurs
7.7. Create and strengthen policies or laws to prevent pollution in estuaries, beaches and at sea, and implement the "Zero Plastics Policy"	• Training on marine debris monitoring, legal enforcement, and coastal pollution management for MALFF Coastal Division, Maritime Police, local governments, and NGOs (e.g., Blue Ventures, Haburas Foundation)	• Engage women's coastal groups in cleanup and monitoring • Ensure gender balance in marine protection committees • Promote women's roles in eco-tourism linked to clean coasts
7.8. Raise community awareness of how to 'Reduce, Reuse, and Recycle' by organizing Communication, Education and Public Awareness (CEPA) campaigns by engaging women and youth groups	• Training on communication for environmental behavior change (C4D), campaign design, and community facilitation for Ministry of Education, NGOs, youth groups, and CBOs at municipal level	• Engage women and youth as awareness leaders • Produce gender-sensitive education materials in Tetum/local languages • Promote women's environmental leadership in schools and villages
8. Continue to minimize the ongoing impacts of climate change and ocean acidification on biodiversity and increase ecosystem resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solutions and/or ecosystem-based approaches		
8.1. Conduct climate vulnerability assessments and develop integrated climate adaptation plans for Ministries and departments including forests, agriculture, environment to minimize climate change impacts , ensuring women's participation in adaptation consultations (at least 50% in rural	• Training on climate risk assessment, vulnerability mapping, and ecosystem-based adaptation (EbA) planning for MALFF, NDFA, Ministry of Environment, National Directorate for Climate Change, and municipal governments	• Ensure women's participation in adaptation consultations • Integrate gender-disaggregated vulnerability data • Promote women's leadership in community adaptation committees

areas), integration of gender-disaggregated vulnerability data, and strengthened institutional capacity to collect sex-disaggregated environmental data (Ongoing programme)		
8.2. Continue reforestation as both mitigation and adaptation to climate change, including reforesting degraded river valleys and other areas requiring soil protection (Ongoing MALFF programme and see Action 4)	• Technical training on native species propagation, forest restoration, and carbon monitoring for MALFF Forestry Division, local community forestry groups, NGOs (e.g., Haburas, HASATIL), and youth green clubs	• Include women in nursery and restoration activities • Provide equal access to incentive payments • Ensure gender-sensitive work conditions and safety
8.3. Research, produce, and provide seeds for key crops (maize, rice, pulses) adapted to a drier, warmer climate to communities to improve agricultural outputs, including by conserving local varieties to avoid genetic erosion (Ongoing MALFF programme)	• Training on climate resilient seed breeding, storage, and distribution for National Seed Department (MALFF), UNTL agriculture faculty, research institutions, and farmer cooperatives	• Ensure women farmers have access to improved seed programs • Support women's cooperatives in seed multiplication • Recognize women's traditional seed saving knowledge
8.4. Conduct carbon farming projects using ecosystem-based approaches to improve landscape connectivity, restore heterogeneous forests, recover mangroves, wetlands, grassland, seagrass meadows, and taking into account conservation and restoring biodiversity by adopting Blue Economy principles (learning can be obtained from an ongoing project for carbon farming and funded by the EU and implemented by World Vision and carbon offset Timor Foundation (FCOTI)	• Training on carbon accounting, MRV systems, carbon market readiness, and ecosystem-based mitigation for MALFF Climate Change Division, NDFA, local governments, farmer groups, and private agribusinesses	• Ensure equitable benefit sharing of carbon revenues • Involve women in decision making on carbon projects • Train women on climate finance and green enterprise development
8.5. Integrate and mainstream biodiversity and climate change into national and sectoral plans and establish cross-ministerial coordination platform	• Training on biodiversity–climate mainstreaming frameworks and policy integration tools • Capacity building on cross-ministerial coordination mechanisms, roles, and information sharing • Training on using climate and biodiversity data to inform sectoral planning and budgeting	• Ensure women's participation in cross-ministerial coordination platforms and planning processes • Integrate gender-responsive climate and biodiversity priorities into sectoral policies and plans • Apply gender-sensitive indicators to track mainstreaming outcomes
9. By 2030, ensure the sustainable management and use of wild species and other biological resources in Timor-Leste to deliver equitable social and economic benefits for local communities, especially those most dependent on biodiversity, through sustainable biodiversity-based livelihoods, while safeguarding customary practices and traditional knowledge		
9.1. Expand sustainable wild species-based livelihoods (terrestrial, marine/coastal, and freshwater), including small-scale fisheries, sustainable harvest,	• Technical training for communities and extension officers on sustainable harvest of wild species, climate-resilient agroforestry, small-scale fisheries management, aquaculture, and NbS practices	• Ensure women's access to skills, inputs, and technologies (e.g. aquaculture, NTFPs, ecotourism services)

agroforestry, aquaculture, ecotourism, and non-timber forest products (NTFPs) using Nature-based Solutions (NbS) approaches	• Training on business skills, quality standards, and resource-efficient production	• Reduce barriers for women and youth to enter wild species-based livelihood activities
9.2. Establish and strengthen sustainable wild species-based value chains to promote ecotourism, small and medium-sized enterprises, women-led entrepreneurship, and the circular economy, thus contributing to local economy and livelihoods	• Training on value-chain development, product diversification, marketing, certification, and eco-labelling • Capacity building on circular economy approaches and sustainable tourism standards	• Support women-led and youth-led enterprises through targeted training, mentoring, and access to finance • Promote equitable participation of women across the value chain, not only in low-value activities
9.3. Establish transparent benefit-sharing systems for income and non-monetary benefits derived from wild species and other biological resources (e.g., fisheries, ecotourism, conservation agreements, PES), ensuring women, youth, and vulnerable groups have equal access to wild species-based livelihood opportunities, training, leadership, and benefit-sharing	• Training for government and communities on benefit-sharing mechanisms, PES design, and transparent financial management • Capacity building on ABS principles and grievance mechanisms	• Ensure benefit-sharing rules explicitly include women, youth, and vulnerable households • Promote joint decision-making by men and women in benefit-sharing arrangements
9.4. Formally recognize and support customary rules and traditional knowledge for sustainable wild species use and management, including community governance in LMMAs, community forests, and inland waters.	• Training for officials and community leaders on customary governance systems, FPIC, and rights-based approaches • Documentation and validation of traditional knowledge related to wild species management	• Recognize and protect women's traditional ecological knowledge and gender-specific resource use • Ensure inclusive participation in customary governance bodies
9.5. Monitor and report the social and economic benefits from sustainable wild species use (land, marine, and freshwater) within national and municipal plans, budgets, and the NBSAP M&E system	• Training on headline, component, and complementary indicators, data collection, and reporting at municipal and national levels • Capacity building on participatory monitoring involving communities and local institutions	• Collect sex-disaggregated data on income, employment, and participation • Use monitoring results to address gender gaps and adjust programmes accordingly
10. By 2030, ensure the sustainable management of forests, fisheries, agriculture, aquaculture, and wildlife in Timor-Leste by promoting ecosystem-based practices, strengthening enforcement, and supporting community-based livelihoods to safeguard biodiversity and ecosystem services		
Forestry		
10.1. Document and promote traditional knowledge, techniques, and practices for the conservation and sustainable use of biodiversity, including *tara bandu* system	• Training on participatory documentation methods, data management, and intellectual property protection for MALFF, NDFA, NGOs (Haburas, RAEBIA), and local community leaders	• Include both women and men in traditional knowledge documentation • Recognize women's ecological knowledge (medicinal plants, seed saving)

		• Ensure benefit sharing and consent for use of indigenous knowledge
10.2. Promote agroforestry, high value tree planting, elephant grass, and bamboo plantationsin at least 4 municipalities as a mechanism to improve livelihoods and promote sustainable management of the surrounding natural forest, in part through community forestry (Ongoing project through JICA; recent EU project completed)	• Training on agroforestry design, bamboo management, and sustainable tree cultivation for MALFF Forestry Division, JICA project teams, municipal agriculture offices, and farmer cooperatives	• Encourage women's participation in agroforestry cooperatives • Provide equal access to seedlings and extension services • Promote women-managed home-based bamboo enterprises
10.3. Develop management plans to enable sustainable forest management in all municipalities	• Capacity building on forest inventory, GIS mapping, and plan formulation for Municipal Environment and Forestry Units, MALFF, and local forest user groups	• Ensure women's representation in forest management committees • Integrate gender-responsive benefit sharing schemes • Consider women's dependence on forest resources (fuelwood, NTFPs)
10.4. Increase enforcement to reduce illegal logging, including through training of officers	• Training on forest law enforcement, evidence collection, and use of drones/satellite tools for MALFF Forestry Inspection Unit, Customs, Maritime Police, and municipal rangers	• Recruit and train women as forest officers • Ensure gender-sensitive work conditions (field safety, sanitation) • Include gender awareness in enforcement training
10.5. Continue to develop and improve the Aileo Municipal Botanical Garden to protect tree species and as a tourist destination (Ongoing MALFF programme)	• Training on botanical garden management, visitor interpretation, and eco-tourism operations for MALFF, local tourism offices, and community-based organizations	• Promote women's employment in eco-tourism services • Provide women with skills in hospitality and conservation education • Ensure safety and inclusion in tourism activities
10.6. Establish community-based nurseries especially for high-value timber trees, focusing on native tree species, and involve local communities in reforestation/planting activities, promoting women's leadership in nursery management and decision-making and equitable participation in benefit-sharing	• Training on nursery establishment, propagation, and sustainable timber production for MALFF Forestry Division, community forestry groups, and youth associations	• Ensure women's involvement in nursery management • Offer equal income opportunities in planting and seedling sales • Build women's capacity in financial record keeping and leadership
Fisheries		
10.7. Finalize and implement the fisheries strategic action plan and National Ballast Water Management Strategy to promote sustainable fishing including for the offshore fishery, and draft the Blue Economy Policy, revisiting the draft National Ocean Policy (Ongoing MALFF programme)	• Training on sustainable fisheries governance, Blue Economy frameworks, and policy implementation for MALFF Fisheries Division, NDFA, and coastal municipal governments	• Ensure women fishers and vendors are included in policy consultations • Promote gender equity in coastal employment and fish markets • Support women's cooperatives in value chain development
10.8. Promote campaigns at fishing communities for fishing techniques that reduce risk of depleting fish production capacity, including by defining open and closed areas through increased LMMAs	• Training on sustainable fishing methods, LMMA governance, and community monitoring for local fishers, LMMA committees, NDFA, and MALFF Fisheries Division.	• Involve women in LMMA committees and monitoring teams • Provide women equal access to gear, training, and markets

(Ongoing MALFF programme with WorldFish and Blue Ventures)		• Recognize women's role in post-harvest processing and trade
10.9. Establish and implement Integrated Coastal Management (ICM) programmes focusing on sustainable livelihood development, including sustainable fishery management with support to the artisanal fishery sector (learning from PEMSEA can be replicated)	• Capacity building on ICM tools, coastal zoning, and conflict management for MALFF Coastal Division, local governments, NGOs, and fishing communities	• Ensure women's voices in coastal livelihood planning • Promote gender equitable access to marine resources • Encourage women's participation in ecosystem restoration
10.10. Enhance fishery production quality and improve distribution of sustainable fisheries production, including developing fisheries production quality standards	• Training on fish handling, hygiene, processing, and marketing for fisher cooperatives, NDFA, private sector buyers, and women's fish vendor groups	• Train women in quality control and packaging • Support women vendors with better access to facilities • Promote equitable roles in fisheries value chains
10.11. Support the creation of financial institutions to provide small and rotating loans for fishermen and fish-farming communities (Possible collaboration with FAO for this action.)	• Training on microfinance design, savings group facilitation, and credit management for coastal banks, microfinance institutions (MFIs), and fisher associations	• Ensure women's equal access to credit • Support women's savings cooperatives • Provide financial literacy programs for women entrepreneurs
10.12. Transform Maubara National Institute of Fisheries and Aquaculture into an integrated center for Fisheries and Aquaculture Research development and capacity building, which includes an educational and a fishery monitoring component	• Training on aquaculture technology, fish genetics, and research management for MALFF Fisheries Directorate, NDFA, and Betano R&D staff	• Encourage female researchers in aquaculture science • Provide gender-sensitive lab and field facilities • Integrate gender in research priorities (e.g., household aquaculture)
10.13. Establish a National Centre for Cetacean Regulation, Research, and Control (cf. Target 4)	• Technical training on marine mammal ecology, regulation enforcement, and research methodologies for MALFF Marine Division, NDFA, and partner universities	• Include women researchers and rangers in marine monitoring • Train women on data management and outreach • Encourage women's participation in marine tourism initiatives
10.14. Improved maritime enforcement, including through the use of satellite technology	• Training on satellite-based monitoring, vessel tracking systems, and data interpretation for Maritime Police, NDFA, and MALFF Marine Inspection Unit	• Ensure women's inclusion in maritime monitoring roles • Provide training and safe working environments for female officers • Integrate gender sensitivity in maritime law enforcement
Aquaculture	•	
10.15. Improve the fish hatcheries by providing improved equipment ensuring sustainable production	• Practical training on hatchery management, equipment maintenance, broodstock selection, and water quality monitoring for MALFF Fisheries Division, NDFA aquaculture technicians, and private hatchery owners	• Train women in hatchery management and record keeping • Encourage women's employment in hatchery and fish breeding • Ensure equal access to aquaculture equipment and technologies
10.16. Provide support to 2,565 freshwater aquaculture families, 2,820 marine aquaculture families and	• Training on sustainable aquaculture techniques (feeding, disease control, pond construction, waste	• Include women in aquaculture technical and marketing training

	172 salt farming aquaculture families for sustainable production and harvest (Ongoing activity, so expand it)	management) for MALFF Fisheries Directorate, NDFA, local cooperatives, and NGOs (WorldFish, Blue Ventures)	• Promote women's access to inputs (feed, fingerlings, loans) • Ensure equitable workload and benefit sharing between men and women
10.17.	Train 100 aquaculture families with new technology applicable to the cultivation and sustainable harvest of freshwater, brackish, and marine fish	• Capacity building on integrated multi-trophic aquaculture (IMTA), cage culture, and low cost feed systems for MALFF Fisheries Division, NDFA, and community aquaculture associations	• Ensure women and youth attend training equally • Promote women's leadership in aquaculture cooperatives • Provide gender-sensitive timing and venues for training sessions
10.18.	Establish aquaculture groups or associations to multiply certified and commercial fingerlings	• Training on certification standards, association governance, and business management for MALFF Aquaculture Unit, NDFA, private hatchery owners, and cooperative leaders	• Ensure women's membership in producer associations • Support women-led hatchery or marketing • Facilitate women's access to finance for certification processes
10.19.	Establish new fish feed production centres (Has been built or established 6 and potentially to have another 2 in Baucau and Covalima)	• Technical training on fish feed formulation, mixing, processing, and quality control for MALFF Fisheries Division, NDFA technicians, private sector aquaculture entrepreneurs, and vocational institutes	• Involve women in fish feed production and distribution • Support women's entrepreneurship in aquaculture supply chains • Ensure equitable profit sharing from feed enterprises
Agriculture			
10.20.	Introduce and promote appropriate and biodiversity-friendly improved farming practices to increase production in agricultural lands, including alley cropping, crop rotation, terracing, reducing slash and burn practices, and using climate-ready high-yield seeds, ensuring at least 50% women beneficiaries, support to at least 30% young women in horticulture and fruiticulture, and promotion of women's leadership in agricultural decision-making (Ongoing MALFF Programme).	• Farmer field training on soil conservation, mixed cropping, climate-smart techniques for MALFF Agriculture Division, extension workers, and farmer cooperatives	• Prioritize women farmers for training on climate resilient crops • Support women's seed saving and storage initiatives • Ensure training schedules are compatible with household duties
10.21.	Improved livestock management and sustainable grazing to reduce the risk and impact of overgrazing from livestock	• Training on sustainable grazing practices, stocking rates, and pasture management • Capacity building on livestock health, nutrition, and rotational grazing systems • Training on rangeland monitoring to detect overgrazing and land degradation	• Ensure women's participation in livestock management training and extension services • Recognize and support women's roles in small livestock rearing and pasture management • Promote equitable access to resources (training, inputs, veterinary services) for women livestock keepers
10.22.	Continue to diversify types of products and develop alternatives to subsistence agriculture through the Seeds of Life Programme and research programmes at MALFF (Ongoing by MALFF)	• Training on new crop trials, seed multiplication, and marketing for MALFF Research Division, Seeds of Life program, and local cooperatives	• Ensure women's access to new crop technologies • Promote women as seed entrepreneurs • Integrate women's traditional crop knowledge

10.23. Establish gene banks and community seed banks to ensure sustainable supply of seeds of native crop varieties (Ongoing MALFF Programme).	• Training on seed conservation, data recording, and biosecurity protocols for MALFF Seed Bank Unit, UNTL, and agricultural researchers	• Include women in seed collection and documentation teams • Recognize women's seed conservation roles • Ensure equitable access to genetic resources
10.24. Provide subsidies to farmers who use sustainable techniques to improve crop production	• Training on sustainable farming techniques (organic composting, IPM, drip irrigation), record keeping, and subsidy management for MALFF Agriculture Division, municipal agriculture offices, farmer cooperatives, and women farmers' groups	• Ensure equal access to subsidies for women farmers • Simplify application procedures to accommodate literacy differences • Monitor gender distribution in subsidy disbursement
10.25. Conduct research, development, and dissemination of seeds for specific crop varieties to improve crop yields on less land including through proper zonation of lands for crop types. (Ongoing MALFF Programme).	• Training on agro ecological mapping, GIS-based land use zonation, and adaptive crop research for MALFF Research Division, NDFA, municipal planners, and agricultural research institutions (UNTL)	• Include women farmers in land use planning discussions • Ensure women access information on suitable crops for their lands • Integrate women's traditional cropping knowledge into zoning plans
10.26. Map agro-ecological zones (ongoing)	• Technical training on remote sensing, soil survey, and climate data integration for MALFF GIS Unit, NDFA, universities (UNTL, IOB), and municipal planning offices	• Engage women extension officers and local youth in mapping • Use participatory mapping involving women farmers • Ensure zoning data reflects gender-specific livelihood patterns
Wildlife		
See Target 5		
11. By 2030, restore ecosystem services on 20% of degraded areas using ecosystem-based approaches such as watershed and coastal restoration, integrated water management, and payment for ecosystem services		
11.1. Develop educational materials for educating school children about the important relationship among biodiversity conservation, ecosystem services, and human health	• Training on environmental communication, curriculum development, and participatory education for Ministry of Education, MALFF Environmental Directorate, NDFA, NGOs (Haburas, RAEBIA), and local teachers	• Ensure women's involvement in awareness and outreach programs • Use gender-sensitive and locally relevant materials • Highlight women's roles in maintaining ecosystem health and water quality
11.2. Develop and implement an Integrated Water Management Plan, involving key concerned sectors (forestry, infrastructure, water management authorities) to address pollution and sedimentation	• Training on Integrated Water Resources Management (IWRM), watershed modeling, and stakeholder coordination for MALFF Water Directorate, NDFA, Ministry of Public Works, municipal governments, and watershed committees	• Ensure women's participation in water governance structures • Integrate gender-based water use data and needs • Promote women's leadership in watershed management
11.3. Monitor pollution/water quality, sedimentation of rivers, soil erosion and implement restoration activities to prevent siltation (see Target 7) (an ongoing activity done by BTL)	• Technical training on water quality monitoring, sedimentation control, and soil conservation methods for MALFF, NDFA, National Laboratory, municipal officers, and local communities	• Engage women in community water quality monitoring teams • Provide equal access to training and equipment • Address gender roles in water collection and

		management practices
11.4. Develop water quality standards and establish a water quality laboratory, including recruitment and training of women as lab technicians and water monitoring specialists and adoption of gender-inclusive workplace policies	• Capacity building on laboratory setup, water testing procedures, and data analysis for MALFF Environmental Laboratory Unit, NDFA, Ministry of Health (Water Division), and university science departments	• Recruit and train women as lab technicians and water monitoring specialists • Ensure equal professional opportunities in science and research • Promote gender-inclusive workplace policies in laboratories
11.5. Develop and implement a payment for ecosystem services (PES) scheme for water and forest resources	• Training on PES design, valuation methods, and benefit sharing mechanisms for MALFF, Ministry of Finance, NDFA, watershed management groups, and local governments	• Ensure equitable participation and benefit-sharing for women and men • Support women's cooperatives in PES-funded livelihood activities • Include gender-sensitive indicators in PES monitoring
11.6. Continue recovery of degraded lands, especially along river valleys and coastal areas, including 15 watershed plans completed (see Target 2) (Ongoing MALFF Programme)	• Field training on riverbank stabilization, mangrove and coastal planting, and bioengineering methods for MALFF Forestry Division, NDFA, municipal environment units, and community-based organizations	• Engage women's groups in reforestation and restoration works • Provide income opportunities through restoration programs • Consider women's time and safety in restoration activities
11.7. Promote and develop the commercial production of seaweed as an alternative livelihood (Ongoing activity, and seaweed has been exported to Korea, China and Indonesia)	• Training on seaweed farming techniques, post-harvest processing, and marketing for MALFF Fisheries Division, NDFA, coastal cooperatives, and private sector partners (Blue Ventures, WorldFish)	• Ensure women's inclusion in seaweed production cooperatives • Support women's access to markets, training, and finance • Promote gender equitable profit sharing in seaweed value chains
12. Significantly increase the area, quality, and connectivity of, and benefits from, green and blue spaces in Dili, Baucau, and other municipalities, and ensure that biodiversity is considered in urban and other municipal planning by 2030		
12.1. Improve and rehabilitate the waterfront and shoreline in Dili	• Training on urban coastal ecosystem restoration, green infrastructure design, and maintenance for MALFF, Ministry of Public Works, Dili Municipality, and urban planning consultants	• Ensure women's participation in planning and design • Incorporate women's safety and accessibility in public spaces • Promote women's employment in maintenance and landscaping
12.2. Improve co-operation among the Environment Department, the Ministry of State Administration, and the Ministry of Public Works for the restoration and creation of gardens and green spaces in Dili, Baucau, and other municipalities, with women's participation in municipal decision-making and employment in nursery, park, and	• Training on inter agency coordination, green urban planning, and project management for MALFF, Ministry of Tourism, municipal authorities, and local NGOs (Haburas, RAEBIA)	• Include women in municipal decision making on green spaces • Design gardens that accommodate children and elderly care needs • Employ women in nursery, park, and garden maintenance programs

garden maintenance programmes		
12.3. Develop and expand green spaces for citizens, with recreational trails to improve biodiversity, greenery and human health	• Training on integrating green space design into land use planning and building codes for Ministry of Public Works, MALFF, National Directorate for Urbanism, and municipal planning units	• Ensure women's safety and inclusion in recreational design • Engage women in participatory urban planning workshops • Promote gender-responsive city planning and park management
12.4. Implement 'Green List' of protected and conserved area pathway, with women's representation in site governance and assessment teams and integration of gender-responsive governance criteria	• Training on IUCN Green List standards, criteria, and application processes • Capacity building on site-level governance, management planning, and performance assessment aligned with Green List requirements • Training on documentation, self-assessment, and independent evaluation procedures	• Ensure women's representation in Green List site governance and assessment teams • Integrate gender-responsive governance and equity criteria into Green List processes • Promote inclusive stakeholder engagement, including women and marginalized groups, during Green List implementation
13. By 2030, complete accession to and fully implement the Nagoya Protocol to promote benefit-sharing mechanisms for the use of genetic resources and traditional knowledge		
13.1. Complete the accession process (Ongoing Dept. of Environment Programme)	• Training on ABS procedures, legal drafting, and compliance monitoring for Department of Environment, Ministry of Justice, MALFF, and academic institutions	• Ensure women's representation in ABS policy consultations • Protect women's intellectual and traditional knowledge rights • Integrate gender-sensitive clauses in ABS legislation
13.2. Conduct an awareness-raising programme for policymakers, government and non-government stakeholders, including private sectors and communities to understand the Nagoya Protocol and why its implementation is important to Timor-Leste (ABS)	• Training on ABS principles, genetic resource governance, and community outreach for Department of Environment, MALFF, NGOs, and municipal environment offices	• Include women leaders and traditional healers in awareness sessions • Ensure equitable benefit sharing for women in community-based biodiversity enterprises • Develop gender-inclusive ABS training materials
14. Government integrates conservation and sustainable use of biodiversity into all sectoral management and development policies, plans, and processes, considers a national accounting for ecosystem services, and ensures that EIAs are conducted for all proposed developments by 2030		
14.1. Form a national-level government-wide environment committee with a mandate to consider cross-cutting issues related to development, including issues such as biodiversity, climate change, gender, tourism, capacity-building and education, and human health	• Training on environmental policy coordination, meeting facilitation, and reporting for Department of Environment, NDFA, and focal points from all key ministries	• Ensure gender balance in the national committee • Promote women's participation in decision making roles • Integrate gender in committee TORs and reporting

14.2. Continued implementation of the Environmental Licensing programme for any new developments, as a prerequisite for approval (National Decree No.5/Feb 2011), including training of women environmental officers in EIA review and gender balance in field inspection teams (Ongoing Programme)	• Capacity building on EIA review, monitoring, and enforcement for Department of Environment, municipal environment units, and project proponents	• Train women environmental officers on EIA review • Promote gender balance in field inspection teams • Include social gender impacts in EIA analysis
14.3. Improve the system for obtaining Environmental Licensing to make the process more transparent to the public, including with public consultation for major development projects and respecting the rights of local communities (Ongoing activity)	• Training on public consultation methods, environmental communication, and data transparency for Department of Environment, local governments, and CSOs	• Ensure women's participation in all EIA consultations • Schedule meetings at accessible times and venues • Reflect gendered impacts in final EIA reports
14.4. Improve coordination and communication with petroleum authorities and mining authorities to only provide environmental licenses to companies with environmental protection built into the permit, and after an EIA has been completed (coordination with National Environment Agency)	• Training on environmental compliance monitoring, risk assessment, and enforcement for Department of Environment, Ministry of Petroleum and Minerals, and NDFA	• Include women in EIA compliance and monitoring teams • Integrate gender risks in extractive industry assessments • Ensure women's voices in community consultations near project sites
14.5. Review and, as relevant, update existing agricultural policies, plans and processes, to integrate biodiversity and its multiple values, including sustainable tourism	• Training on biodiversity mainstreaming tools for agriculture and agri-tourism policies • Capacity building on integrating ecosystem services and NbS into agricultural planning • Training on policy review, impact assessment, and cross-sector coordination	• Ensure women's participation in agricultural policy review and consultation processes • Integrate gender-responsive approaches in agriculture, value chains, and agri-tourism • Promote equitable access for women to policy benefits, incentives, and support programmes
15. Establish a pilot programme with 5 businesses to report on their impacts on biodiversity and to develop mechanisms to mitigate these impacts, providing information to consumers on how to reduce waste by 2030. Such programmes could include working with the banking sector (e.g., Banco Nacional de Comercio de Timor-Leste), the oil and gas sector, the shipping sector, and coffee producers (e.g., Timor Global LDA, Café Timor). This target would benefit from the process outlined by the Science-Based Targets Network[33], as well as the BIOFIN documents[34]		
15.1. Select 5 businesses and negotiate terms of an agreement for reporting on risk to and possible	• Training on biodiversity accounting, sustainability reporting, and corporate responsibility for Ministry	• Encourage women entrepreneurs' participation in training

[33] https://sciencebasedtargetsnetwork.org/take-action-now/take-action-as-a-company/what-you-can-do-now/

[34] See: www.biofin.org

impacts on biodiversity and the suitable indicators that will be required (first 3 years)	of Commerce, MALFF, Chamber of Commerce (CCI TL), and private companies	• Include gender equality indicators in corporate sustainability frameworks • Promote women-led businesses adopting biodiversity-friendly practices
15.2. Work with the 5 pilot companies to develop mitigation planning to reduce impacts on biodiversity (final 4years) , including women employees in CSR planning and participation of women in environmental auditing teams	• Training on mitigation hierarchy, biodiversity offset design, and environmental auditing for Department of Environment, MALFF, private sector CSR teams, and consultancy firms	• Ensure women employees are involved in CSR planning • Highlight gender-specific community benefits of mitigation • Promote women's participation in environmental auditing teams
16. By 2030, promote sustainable consumption and waste management through education and policy, legislative or regulatory framework for integrated waste management, recycling, and composting initiatives		
16.1. Continue to strengthen plastic management policies by improving plastic import rules	• Training on policy drafting, import regulation, and enforcement procedures for Customs Authority, Ministry of Finance, MALFF Environmental Inspectorate, and Ministry of Commerce	• Include women officers in customs and inspection teams • Ensure gender-sensitive workplace training • Raise awareness of gendered impacts of plastic waste on health and livelihoods
16.2. Promote and practice integrated waste management and establish waste banks under the municipality authorities' jurisdiction	• Training on waste segregation, valuation, and recycling business management for municipal governments, MALFF, Ministry of State Administration, women's cooperatives, and local NGOs (e.g., Haburas, RAEBIA)	• Ensure women's participation and leadership in waste bank cooperatives • Create equal income opportunities in recycling enterprises • Address safety and sanitation needs of women workers
16.3. Develop and implement elementary and secondary school waste awareness programme and provide information brochures to libraries, involving female teachers and students and promoting girls' leadership in eco clubs	• Training for teachers and students on waste segregation, recycling, and environmental education methods for Ministry of Education, MALFF Environmental Directorate, and municipal education offices	• Involve female teachers and students as waste management champions • Use gender-sensitive educational materials and visuals • Encourage girls' leadership in eco clubs and green school activities
16.4. Develop a public composting system through organic collections from restaurants and other businesses and promote the use of the compost in agricultural areas, including women farmers and waste workers and ensuring equal access to compost-use benefits	• Training on composting technology, waste to resource management, and organic fertilizer application for MALFF Agriculture Division, municipal agriculture offices, farmer cooperatives, and waste management units	• Include women farmers and waste workers in composting projects • Promote women led microenterprises in compost production and sales • Ensure equal access to compost use benefits for female farmers
17. Strengthen capacity for and implement biosafety measures as outlined in Article 8(g) of the CBD, as well as measures for the handling of biotechnology and distribution of its benefits, as set out in Article 19, aligning with the Cartagena Protocol		
17.1. Increase the capacity of ministry staff relevant to	• Technical training on GMO detection, risk	• Recruit and train women biosafety officers

safe food identification of foods contain genetic modifications and additive materials that are regulated by health standards	assessment, and regulatory enforcement for MALFF Biosafety Unit, National Laboratory staff, Ministry of Health (Food Safety), and Customs Authority	• Promote gender balance in scientific and inspection teams • Ensure training accommodates both men's and women's professional needs
17.2. Strengthen facilities and train human resources for biosecurity	• Training on biosecurity protocols, facility management, and inspection systems for MALFF Quarantine Division, NDFA, and border control staff	• Ensure women officers receive equal technical training • Provide safe, inclusive working conditions in quarantine stations • Recognize gender roles in local biosecurity awareness
17.3. Increase staff capacity for the identification and quarantine of new animals and crops	• Capacity-building workshops on pest risk analysis, import/export inspection, and sample handling for MALFF Quarantine Division, Customs, and NDFA officers	• Support gender-balanced recruitment for inspection teams • Offer mentorship for young female inspectors • Provide gender-sensitive facilities in quarantine stations
17.4. Strengthen facilities in quarantine services to implement the Protocol, standards, and database for sanitary and phytosanitary controls to facilitate the import and export of agricultural products, while ensuring the interoperability of a Single Window system	• Training on SPS compliance, inter-agency coordination, and international reporting for MALFF SPS Committee, Ministry of Commerce, and National Laboratory staff	• Include women in SPS policy and training committees • Build women's expertise in international trade compliance • Ensure equal participation in SPS monitoring and reporting
18. Identify by 2027 and progressively phase out or reform incentives harmful to biodiversity, starting with the most harmful incentives, and seek out possibilities to implement positive incentives for the conservation and sustainable use of biodiversity		
18.1. Establish a mechanism for all relevant ministries to indicate and report subsidy programmes to the Environment Department for the relevant National Reports to the CBD and to assess impacts of these subsidies on target and non-target biodiversity, ensuring gender balance in scientific and inspection teams	• Technical training on GMO detection, risk assessment, and regulatory enforcement for MALFF Biosafety Unit, National Laboratory staff, Ministry of Health (Food Safety), and Customs Authority	• Recruit and train women biosafety officers • Promote gender balance in scientific and inspection teams • Ensure training accommodates both men's and women's professional needs
18.2. Conduct research to determine non-target impacts on biodiversity to facilitate implementation of subsidy programmes, ensuring women officers receive equal technical training and safe, inclusive working conditions	• Training on biosecurity protocols, facility management, and inspection systems for MALFF Quarantine Division, NDFA, and border control staff	• Ensure women officers receive equal technical training • Provide safe, inclusive working conditions in quarantine stations • Recognize gender roles in local biosecurity awareness
18.3. Develop mechanisms and integrate into policies to mitigate subsidies and incentives found to have unexpected or negative consequences on biodiversity	• Capacity building workshops on pest risk analysis, import/export inspection, and sample handling for MALFF Quarantine Division, Customs, and NDFA officers	• Support gender-balanced recruitment for inspection teams • Offer mentorship for young female inspectors • Provide gender-sensitive facilities in quarantine stations

18.4. Integrate mechanisms and plans to promote positive incentives to reduce use of natural resources	• Training on SPS compliance, inter-agency coordination, and international reporting for MALFF SPS Committee, Ministry of Commerce, and National Laboratory staff	• Include women in SPS policy and training committees • Build women's expertise in international trade compliance • Ensure equal participation in SPS monitoring and reporting
19. Continue to work with multiple donors and aid/development agencies, including NGOs and the private sector, to increase funding to conserve and manage biodiversity, and for the government to increase relevant agency budgets by at least 15% through building recognition for the importance of conserving biodiversity by 2030		
19.1. Continue taking appropriate initiatives to attract investments from donors including GEF, GCF, etc., and regional funds, and encourage private sector investments specifically for biodiversity (Ongoing)	• Training on proposal writing, donor engagement, and financial reporting for MALFF, Ministry of Finance, NDFA, NGOs, and private investors	• Ensure women participate in project design and finance training • Promote gender-inclusive access to green investment funds • Track gender-responsive finance indicators
19.2. Establish biodiversity fund to promote protection and needed information (data) on biodiversity and establish cross-ministerial coordination platform, confirming women's participation in fund governance and use of gender-responsive funding criteria	• Training on design and management of biodiversity and environmental funds, including governance and fiduciary standards • Capacity building on financial planning, fund allocation criteria, and monitoring of biodiversity investments • Training on cross-ministerial coordination mechanisms, reporting, and accountability for fund management	• Ensure women's participation in biodiversity fund governance and decision-making structures • Promote gender-responsive funding criteria to support women-led and community-based biodiversity initiatives • Track gender-disaggregated finance data and benefits from biodiversity fund investments
19.3. Continue to work diligently with existing UN agencies and donor country partnerships to conserve biodiversity, while carefully assessing donor self-interest vs. what is required in Timor-Leste (Ongoing)	• Training on partnership negotiation, results-based management, and multi-agency coordination for MALFF, UNDP, UNEP, FAO focal points, and national NGOs	• Include women's networks in stakeholder coordination meetings • Promote gender-balanced participation in project management units • Ensure equitable benefits for women from funded projects
19.4. Develop a law and promote the carbon market, specially voluntary carbon market and Internationally Transferrable Mitigation Outcome (ITMO) to facilitate community groups to engage in planting trees, securing women's equal access to carbon payments and benefit sharing	• Training on carbon project design, MRV (Measurement, Reporting, Verification), and financial management for MALFF Climate Change Division, NDFA, and local communities	• Ensure women's equal access to carbon payments and benefit sharing • Build women's capacity in carbon finance and entrepreneurship • Integrate gender equality indicators in carbon projects
19.5. Develop and facilitate community-based fund-raising options (e.g. eco-tourism and introducing tourist tax to fund conservation programmes) to	• Training on community-based financing mechanisms, including ecotourism revenues and tourist tax management	• Ensure women's participation in community fund management and decision-making bodies • Support women-led conservation enterprises

make communities self-sustained in financing biodiversity conservation efforts, ensuring women's participation in fund management and gender-responsive benefit-sharing mechanisms	• Capacity building on financial management, transparency, and accountability for community conservation funds • Training on linking community fund-raising to conservation planning and monitoring	contributing to local fund-raising efforts • Apply gender-responsive benefit-sharing mechanisms for revenues generated
19.6. Ensure implementing agencies (UNDP, FAO, UNEP and etc.) implement programmes that enable data collection, collect and use local knowledge with respect, and that innovations are accessible to the communities (Ongoing)	• Training on data integration, GIS mapping, and traditional knowledge documentation for MALFF, NDFA, Ministry of Planning, and research institutions (UNTL)	• Include women data collectors and researchers • Acknowledge women's traditional knowledge in data collection • Ensure data platforms are gender-inclusive and accessible
19.7. Develop a BIOFIN plan by 2026 (Already initiated in support of UNDP)	• Training on biodiversity finance planning, investment mapping, and resource mobilization for MALFF, Ministry of Finance, NDFA, UNDP BIOFIN team, and development partners	• Ensure women are represented in BIOFIN planning teams • Integrate gender-responsive budgeting into the BIOFIN framework • Include financing for women-led conservation initiatives
20. Continue to facilitate and encourage South-South, North-South, and triangular cooperation to increase capacity and technological skills development of government and university staff, while increasing the understanding of Timor-Leste's biodiversity and ecosystem functioning		
20.1. Assess the needs for capacity building, and to recommend solutions, propose actions, and identify mechanisms to address the identified capacity needs, and gaps in collaboration of the national environmental committee (if established - see Target 13) and other stakeholders	• Training on needs assessment methodologies, institutional capacity diagnostics, and strategic planning for MALFF, NDFA, Department of Environment, and National Planning Commission	• Ensure equal participation of women and men in consultations • Identify gender-specific capacity gaps in environment agencies • Integrate gender-responsive indicators in the capacity plan
20.2. Develop joint programmes with relevant sectors for funding from tender partners (DFAT, JICA, KOICA, AFoCO, etc.) and multilateral (GEF, GCF) adaptation funds, etc. (Ongoing)	• Training on proposal writing, donor coordination, and project pipeline development for MALFF, Ministry of Finance, NDFA, and international cooperation focal points	• Encourage women's participation in donor coordination teams • Build women's capacity in proposal writing and negotiation • Promote gender equality criteria in project proposals
20.3. Create an inter-ministerial commission to produce and share information to ensure gender parity in commission membership and inclusion of women experts in data governance discussions	• Training on data governance, interoperability standards, and cross-sector coordination for MALFF, NDFA, Ministry of Planning, Statistics Office, and ICT Authority	• Ensure gender parity in commission membership • Include women experts in data governance discussions • Integrate gender-sensitive data categories in shared systems
20.4. Establish links or partnerships with regional organisations and interested universities in the Asia region, and improve existing partnerships (e.g., by inviting SPREP to assist in specific marine	• Training on research collaboration, proposal co design, and regional networking for MALFF, NDFA, UNTL, regional partners (SPREP, ASEAN Centre for Biodiversity)	• Support women researchers' participation in academic exchanges • Ensure gender balance in regional partnership programs

monitoring programmes) ensuring gender balance and inclusion of women scientists as lead authors or project coordinators (Ongoing)		• Include women scientists as lead authors and project coordinators
20.5. Ensure that projects from development banks include a strong component to sustainably use and protect biodiversity (Ongoing)	• Training on biodiversity safeguard systems, project screening, and environmental standards for Ministry of Finance, Central Bank of Timor-Leste, MALFF, and development partners (ADB, WB)	• Train women professionals in biodiversity safeguard and finance roles • Include gender-responsive environmental safeguards • Ensure women's voices in project appraisal and monitoring processes
21. By 2030, establish and operationalize a national biodiversity monitoring and database system that integrates scientific research, community-based monitoring, and traditional knowledge to provide baselines, track trends, and inform evidence-based conservation decisions		
21.1. Formulate an interdepartmental environment committee (see Target 13, Action 1) to oversee and support national biodiversity database management (National Biodiversity Information Facility) that uses standardised monitoring protocols and data format	• Training on inter-ministerial coordination, data sharing protocols, and database governance for MALFF, NDFA, Department of Environment, Ministry of Planning, and Statistics Office	• Ensure equal representation of women in the committee • Include gender-responsive data management principles • Encourage women's leadership in data coordination roles
21.2. Strengthen and develop human resources for biodiversity monitoring through workshops and training abroad, as well as through technology transfer from donor agency projects, making sure gender parity among participants and access to mentorship for women in biodiversity monitoring	• Training on biodiversity monitoring methods (species surveys, remote sensing, data analysis) for MALFF, NDFA, universities (UNTL), and NGOs	• Ensure gender parity among participants • Support female scientists and students for overseas training • Provide mentorship programs for women in biodiversity monitoring
21.3. Conduct a comparative study of data collection methods and indicators in other small island developing states to develop tailor-made strategy for Timor-Leste	• Training/exchange programs on biodiversity monitoring systems and indicators for MALFF, NDFA, SPREP, and Pacific regional partners	• Ensure women researchers participate in regional exchanges • Encourage female representation in study missions • Include gender considerations in comparative analyses
21.4. Develop clear NBSAP monitoring obligations and enforce this across the departments	• Capacity-building on monitoring frameworks, indicator development, and data reporting for MALFF, Department of Environment, NDFA, and Ministry of Planning	• Include women focal points in reporting institutions • Integrate gender-disaggregated data collection • Ensure women contribute to monitoring and evaluation (M&E) frameworks
21.5. Acquire and employ traditional knowledge from local communities, at pilot sites, using both oral history and developing community-based sampling for biodiversity and habitats	• Training on participatory monitoring, knowledge documentation, and community engagement for local communities, MALFF, NGOs (Haburas, RAEBIA), and customary leaders	• Include women knowledge holders (e.g., herbalists, seed keepers) • Ensure equal benefit sharing for women participants • Protect women's intellectual and cultural rights in data use
21.6. Ensure that all aid and government projects have a built-in monitoring component that uses indices	• Training on integrating biodiversity indicators in project design and evaluation for MALFF, NDFA,	• Ensure women are included in project design and M&E processes

listed in this NBSAP	Ministry of Finance, and development partners	• Apply gender-responsive monitoring frameworks • Promote transparency and inclusive decision-making
21.7. Launch a National Biodiversity Baseline and Monitoring Programme and continue strengthen it through appropriate data and integrate this into nutrition-sensitive policies and community management of inland waters	• Training on national biodiversity baseline design, indicators, and monitoring protocols • Capacity building on data collection, quality assurance, and trend analysis across ecosystems • Training on linking biodiversity data to nutrition-sensitive policies and inland water management	• Ensure women's participation in biodiversity monitoring and community water management • Recognize women's knowledge on inland waters, fisheries, and food systems • Apply gender-disaggregated indicators in biodiversity and nutrition monitoring
21.8. Collate data and feed into a biodiversity database and portals using rapid biodiversity assessments and link this with CHM, with inclusion of women in data entry, management, and analysis roles	• Training on database management, metadata standards, and data visualization tools for MALFF IT Unit, NDFA, universities, and research partners	• Include women in data entry, management, and analysis roles • Promote digital literacy for women officers • Ensure gender-disaggregated and inclusive biodiversity data
21.9. Conduct characterization, assessment and monitoring of biodiversity, including freshwater biodiversity, for food and agriculture by engaging women and marginalized communities and private sector actors, integrating traditional knowledge of women and marginalized groups and ensuring equitable access to capacity-building and benefits	• Training on biodiversity assessment methods for food, agriculture, and freshwater systems • Capacity building on community-based monitoring involving farmers, fishers, and private actors • Training on data reporting and use to inform agricultural and food security planning	• Ensure active participation of women and marginalized groups in biodiversity assessments • Integrate women's traditional knowledge related to crops, livestock, and freshwater resources • Promote equitable access to capacity building and benefits from biodiversity monitoring initiatives
22. Ensure that women, people with disabilities, and other marginalized groups are represented and have equal participation in decision-making related to biodiversity and land management, and that they have equal rights and access to land and natural resources		
22.1. Ensure that projects enable input from all members of involved communities, with a special emphasis to safeguard participation by women, people with disabilities, other minorities and youth (Ongoing)	• Training on inclusive stakeholder engagement, accessibility standards, and gender-responsive project design for MALFF, Department of Environment, NDFA, and municipal governments	• Mandate women's participation in policy consultations • Ensure accessibility for disabled participants • Track gender-disaggregated participation data
22.2. Ensure that the interdepartmental environmental committee is gender, youth and other minority balanced, to the extent possible	• Capacity-building on gender mainstreaming, inclusive governance, and leadership for committee members from MALFF, NDFA, and Ministry of Planning	• Maintain at least 40–50% women representation • Create mentorship for women in leadership roles • Include gender criteria in committee appointment process
22.3. Invite environmental defenders to share their concerns and feedback on any development project and policy and strategy development efforts (Ongoing)	• Training on public participation processes, environmental rights, and grievance mechanisms for Department of Environment, MALFF, civil society organizations, and human rights commissions	• Ensure equal opportunity for women environmental defenders • Protect women's voices in grievance systems • Provide safe spaces and confidentiality in consultations
22.4. Ensure all new projects will have a component ensuring attention to gender and minority issues (Ongoing)	• Training on gender-responsive project development, gender budgeting, and monitoring tools for project managers in MALFF, NDFA, development partners,	• Require gender and inclusion plans as part of project approval • Ensure equitable benefit sharing with women and

	and NGOs	minorities • Monitor gender-responsive budgeting across projects
22.5. Strengthen the legal recognition of tenure rights for local communities with customary tenure systems	• Training on customary tenure systems, land rights, and relevant national legal frameworks • Capacity building on participatory land tenure mapping and documentation • Training on conflict resolution and mediation related to land and resource rights	• Ensure women's participation in tenure mapping, consultations, and decision-making • Safeguard women's land and resource rights within customary tenure systems • Promote gender-responsive legal and policy reforms on land tenure

TIMOR-LESTE

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