

# The National Biodiversity Strategy and Action Plan of Timor-Leste (2011 – 2020)

Revised Edition 2015



DEMOCRATIC REPUBLIC OF TIMOR-LESTE





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The National Biodiversity Strategy and Action Plan of Timor-Leste was prepared by the National Biodiversity Working Group coordinated by the Ministry of Economy and Development with support from the United Nations Development Programme and the Global Environment Facility.

First published in 2011

**Disclaimer:**

The NBSAP was revised and developed as of 15 February 2015, through national consultation processes with the engagement of all stakeholders from relevant institutions. References made to the institutional framework throughout the body of the text were not subject of this revision. This especially refers to the Chapter 1.4.2 (Governance of Biodiversity) and all related text including Annex IV. Transitional adjustments in the structure of the 6<sup>th</sup> Government at the time of revision finalization did not allow for the update of the institutional framework.



## Vision

By 2020, 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 of Timorese People.





## Acronyms and Abbreviations

<b>ABS</b>	Access and Benefit Sharing
<b>ALGIS</b>	Agriculture and Land Use Geographical information System
<b>AMDAL</b>	Analisis Mengenai Dampak Lingkungan (Environmental Impact Assessment)
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>ATSEA</b>	Arafura in Timor Seas Ecosystem Action Programme
<b>CBD</b>	Convention on Biological Diversity
<b>CEPA</b>	Communication, Education and Public Awareness
<b>CHM</b>	Clearing House Mechanism
<b>COP</b>	Conference of Parties
<b>DNAAI</b>	National Directorate for International Environmental Affairs
<b>DNMA</b>	National Directorate for the Environment
<b>DPANP</b>	Department of Protected Areas and National Parks
<b>EBA</b>	Endemic Bird Area
<b>FRA</b>	Forest Resources Assessment
<b>GEF</b>	Global Environment Facility
<b>GoTL</b>	Government of Timor-Leste
<b>IBA</b>	Important Bird Area
<b>IUCN</b>	International Union for the Conservation of Nature
<b>IWRM</b>	Integrated Water Resource Management
<b>MAB</b>	Man and Biosphere
<b>MDG</b>	Millennium Development Goals
<b>MEA</b>	Multilateral Environmental Agreement
<b>MED</b>	Ministry of Economy and Development
<b>MSS</b>	Ministry of Social Solidarity – Timor-Leste
<b>NAPA</b>	National Adaptation Programme of Action
<b>NBSAP</b>	National Biodiversity Strategy and Action Plan
<b>NCSA</b>	National Capacity Self Assessment
<b>NDA</b>	National Directorate of Agriculture
<b>NDAH</b>	National Directorate of Agriculture and Horticulture
<b>NDE</b>	National Directorate for Environment
<b>NDF</b>	National Directorate of Forests
<b>NDFA</b>	National Directorate of Fisheries and Aquaculture
<b>NDLPCS</b>	National Directorate of land, Property and Cadastral Surveys
<b>NDMD</b>	National Disaster Management Directorate
<b>NDMEA</b>	National Directorate for MEA
<b>NDPP</b>	National Directorate of Policy and Planning
<b>NEGA</b>	National Ecological Gap Assessment
<b>NGO</b>	Non-Governmental Organization
<b>NKSNP</b>	Nino Konis Santana National Park
<b>NPA</b>	National Plan of Action
<b>NSDP</b>	National Strategic Development Plan

<b>NTFP</b>	Non-Timber Forest Products
<b>PEMSEA</b>	Partnership in Environmental Management for the Seas of East Asia
<b>PoWPA</b>	Programme of Work on Protected Areas
<b>SDP</b>	Strategic Development Plan
<b>SEMA</b>	Secretariat of the Environment
<b>SSAA</b>	Secretary of State for Agriculture and Arboriculture
<b>UNCBD</b>	United Nations Convention on Biological Diversity
<b>UNCCD</b>	United Nations Convention to Combat Desertification
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNTAET</b>	United Nations Transitional Administration in East Timor

## Message from the Prime Minister

Since the Restoration of Independence in 2002, Timor-Leste has undertaken a process of State building and peace building. Although we have experiencing many challenges, our nation has achieved ongoing stability and made strong economic progress. This has provided a foundation to address the health and education needs of our people, and to move towards the eradication of poverty. Timor-Leste has prepared its *Strategic Development Plan 2011-2030* to set a path so that we can achieve lasting change for our people through building a prosperous, healthy, safe and well educated nation.

An important focus of the *Strategic Development Plan 2011-2030* is on the environment and sustainable development. In particular, the plan emphasizes the strong relationship of the Timorese people with the environment which has sustained our people for generation. Regrettably, we must also recognize that our environment has suffered in recent times as a result of deforestation, pollution, land degradation and unsustainable agricultural practices. As all aspects of our lives, our culture and our economy are deeply dependent on protecting our environment. And so we all have a strong collective responsibility to conserve Timor-Leste's biodiversity. The *Strategic Development Plan 2011-2030*, therefore, commits Timor-Leste to developing this *National Biodiversity Strategy and Action Plan* to identify national priorities for conserving Timor-Leste's biodiversity and wisely using our biological resources.

Timor-Leste acceded to United Nations Convention on Biological Diversity in 2007 and the targets established under this convention establish global strategic goals and corresponding benchmarks for implementation at the national level. These targets are therefore an important guide for Timor-Leste in its implementation of the convention.

The *National Biodiversity Strategy and Action Plan*, recognizing that human activities and the unsustainable use of natural resources are the main causes of biodiversity loss in Timor-Leste, has been developed to assess current threats to our marine and land biodiversity, and to identify strategies and incentives to more sustainably use these resources. It is a "living" planning document that compiles national laws, plans, programs and projects directed towards addressing the threats to our biodiversity.

I strongly commend the *National Biodiversity Strategy and Action Plan* which provides a framework for addressing the threats to our unique biodiversity and wealth of natural resources and will inform the State, civil society and private sector approaches to ecosystems management. The success of implementing the Plan will rely heavily on the work and coordination across government and with the private sector and I encourage everyone involved to collaborate in a spirit of cooperation.



**Kay Rala Xanana Gusmão**  
Prime Minister

On behalf of the Government and the people of Timor-Leste I would like to congratulate all the people that contributed to and supported the preparation of the *National Biodiversity Strategy and Action Plan*. The critical task now ahead of us is to implement the Plan with determination and commitment. I am confident that we can all work collaboratively, and in solidarity, to conserve and protect Timor-Leste's biodiversity and secure a better future for our people.

A handwritten signature in black ink, appearing to be 'X. Wong', written in a cursive style. The signature is positioned below the main text and is partially enclosed by a long, sweeping underline that extends to the left.

## Foreword

Biological diversity or “biodiversity” refers to the variety of all forms of life on earth and is essential to the wellbeing of our planet. The intrinsic value of biodiversity has an impact on economic, social and cultural aspects of our life and is a fundamental component of development, not least in relation to agriculture, forestry, fishing and tourism.

The United Nations Convention on Biological Diversity (UNCBD) was inspired by the world community’s growing commitment to sustainable development and was opened for signature at the United Nations Conference on Environment and Development – the Rio Earth Summit in 1992. Restoring independence in 2002, Timor-Leste became a party to the Convention on 8<sup>th</sup> January 2007, upon its ratification by the National Parliament. The convention represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the use of genetic resources. It requires countries to prepare a national biodiversity strategy, or equivalent

instrument and to ensure that this strategy is mainstreamed into the planning and activities of all those sector whose activities can have an impact (positive and negative) on biodiversity. As a Least Developed Country (LDC), the focus of Timor-Leste is primarily to identify measures to conserve and protect its biodiversity wealth and design strategies for the sustainable use of natural resources to bring communities out of poverty.

Timor-Leste is a coastal country with various tropical ecosystem types and high biodiversity. The National Biodiversity Strategy and Action Plan (NBSAP) will be a guiding framework for biodiversity conservation and serve as a safeguard in achieving the country’s strategic development agenda in the next two decades. The NBSAP identifies five priority strategies for biodiversity conservation and protection, based on the needs of the Timorese people. It is consistent with the country’s development priorities, as well as the globally agreed strategic goals of the UNCBD. Its participatory formulation process was led by the Ministry of Economy and Development and the Secretary of State for Environment with support from the Global Environment Facility (GEF) and UNDP. This document is significantly important not just to comply with the obligations of the convention but also as a tool for the government and development partners to identify and implement priority strategies in all sector of government.

I would like to congratulate the Government of Timor-Leste for the work that has been done in leading the NBSAP process and ensuring that it has been fully participatory, bringing



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together a wide range of stakeholders at all levels. I expect that the NBSAP will become an important tool for the Government and development partners to address biodiversity threats and strengthen protection and conservation of ecosystem while strengthening the economy and livelihoods of the nation. The Government of Timor-Leste has already recognized the value of biodiversity in its Strategic Development Plan 2011-2030, in which it commits to meeting several of the UNCBD global targets. Thus, the implementation of the NBSAP will prove an important step in the Government's journey to reduce the loss of natural habitats, conserve biodiversity and ecosystem services, while at the same time embarking on a path toward sustainable development.

The United Nations has declared the period of 2011-2020 "The Decade on Biodiversity" and will continue to support the Government of Timor-Leste in its efforts to promote biodiversity conservation and sustainable social and economic development. In the words of Ban Ki-moon, Secretary-General of the United Nations, "...biodiversity underpins the functioning of the ecosystems on which we depend for food and fresh water, health and recreation, and protection from natural disasters. Its loss also affects us culturally and spiritually. This may be more difficult to quantify, but is nonetheless integral to our wellbeing."



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## Executive Summary

This National Biodiversity Strategy and Action Plan is Timor-Leste's guiding framework to conserve its biodiversity and serves as safeguard in achieving the country's development agenda in the next two decades.

The Strategy is closely anchored on the National Strategic Development Plan of Timor-Leste (2011-2030). It is consistent with the country's other sectoral policy frameworks such as the National Adaptation Programme of Action on Climate Change (December 2010), the National Action Programme to Combat Land Degradation (February 2009), the Fisheries Sector Plan and the Forestry Sector Plan.

The Strategy is also a guiding policy framework for district and sub-district authorities, civil society and the private sector in their approaches to biodiversity conservation and ecosystems management. The success of implementing the Strategy involves close coordination among the key directorates of government concerned in biodiversity conservation and natural resources management, relevant economic sectors of the government, and with the private sector. It also involves updating of current programmes and setting priorities for programming and funding.

### Development Vision of Timor-Leste

The National Strategic Development Plan of Timor-Leste (2011 – 2030) is a 20-year vision that reflects the aspirations of the Timorese people to create a prosperous and strong nation. The Plan covers three key areas: social capital, infrastructure development and economic development. It envisions Timor-Leste to have joined the ranks of upper-middle-income countries, having ended extreme poverty, eliminated the economic gap with the emerging economies of the Association of Southeast Asian Nations, and fostered a democratic and environmentally sustainable society, by 2030.

Specifically, the Plan envisions that, by 2030, a strong bond between the Timorese people and their environment will be restored and the natural resources and environment managed sustainably for the benefit of all. The protection of biodiversity, key habitats and ecosystems is part of the Plan.

The National Biodiversity Strategy and Action Plan comes at an opportune time to serve as a roadmap to achieve the environment and sustainable development targets of the National Strategic Development Plan.

### Timor-Leste as a Member of the Global Community

Timor-Leste became a Party to the Convention on Biological Diversity on 8 January 2007, upon its ratification by the National Parliament. As a Party to the Convention, Timor-Leste has undertaken a national process to develop its National Biodiversity Strategy and Action Plan by engaging all sectors of the country to achieve the objectives of the Convention.

The Strategy uses the ecosystem approach and considers the maintenance of ecosystems services and functions, including among others, provision of food, water and fuel; cultural services; habitat provision; climate regulation, pollination or seed dispersal.

As a continuous process that would consolidate the actions and aspirations of Timor-Leste towards a sustainable future, the Strategy comprises a living planning document that compiles national laws, plans, programmes and projects, a biodiversity communication and

public awareness strategy, a Clearinghouse Mechanism, which will serve as platform for information and knowledge management on biodiversity to aid in policy decision-making, and a funding plan to conserve and sustainably use the country's biodiversity in an equitable manner.

The document also outlines Timor-Leste's strategy to ratify and implement the Nagoya Protocol on Access to Genetic Resources and Benefit-Sharing – to achieve the third objective of the Convention on Biological Diversity. The country would need a systematic capacity-building strategy to achieve this, protect its sovereign resources and provide benefits to all Timorese people.

The Strategy covers four major sections: (1) the context describing the wealth and threats to biodiversity; (2) the strategy defining the vision and priority strategic goals; (3) the action plan, specifying the key milestones and Timor-Leste's Plan for capacity-building on biodiversity; and (4) the implementation plan, including the coordinating mechanism and monitoring system. This last section features the Communication, Education and Public Awareness Strategy to systematically promote the values of biodiversity and the Clearinghouse Mechanism.

### Importance of Biodiversity and Natural Resources to Timor-Leste

Biological diversity or biodiversity is the variety of all life forms. It encompasses three levels of diversity: genetic, species and ecosystems. Genetic diversity is the variety of genetic information contained in individual plants, animals and micro-organisms. Species diversity is the variety of species and ecosystem diversity is the variety of habitats, ecological communities and ecological processes.

The Convention on Biological Diversity defined biodiversity as the variability among living organisms such as terrestrial, marine and other aquatic systems. Biodiversity is constantly changing. It can be increased by genetic changes and evolutionary processes, or it can be reduced by threats that lead to biodiversity population decline and extinction. Biodiversity is the life-support system for all human beings. It provides food, health, shelter, medicine, fuel, clean air and water, contributes to local livelihoods, and regulates the overall climate system.

The Timorese people are dependent on natural resources, biodiversity and the functioning of the country's key ecosystems and habitats. Their development priorities to promote agriculture and tourism are highly dependent on natural resources and the natural beauty of Timor-Leste and its landscapes.

### Globally Significant Biodiversity in Timor-Leste

Timor-Leste is home to a number of globally significant ecosystems and endemic species and is positioned in a biodiversity hotspot called Wallacea. This hotspot is situated 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. These high biodiversity regions influence the composition of the flora and fauna found in Timor-Leste. The Malesian region, where Timor-Leste belongs, is recognized as a region of high plant biodiversity with an estimated 41,000 plant species, including 70 percent of species endemic to that region (Roos, *et al.* 2004; van Welzen, *et al.* 2005).

The Lesser Sunda Island region, of which Timor-Leste is part of, has plants that also occur in the Kimberley or Northern Territory of Australia. Such plants include *Lepisanthes rubiginosa*, *Melochia umbellata* and *Secamone timorensis*, all on Timor-Leste and known in Australia only from monsoon forest in the north-west Kimberley. Other examples include vines (*Cyathostemma glabrum*, *Dichapetalum timorense*), shrubs (*Hibiscus vitifolius* and *Pentapetes phoenicea*) and trees (*Pittosporum moluccanum*, *Santalum album* and *Suregada glomerulata*), which are all known in Timor-Leste, but in Australia, are found only in the Northern Territory.

*Eugenia reinwardtiana*, *Garuga floribunda*, *Lagerstroemia archeriana* and *Proiphys amboinensis* all occur in Timor-Leste, the Kimberley and Cape York but not in the Northern Territory.

The most recent estimate of the proportion of endemic plant species for the Lesser Sunda Islands (based on families treated in Flora Malesiana) is 5.2 percent, a figure slightly below the average for Malesian phytographic areas (Cowie 2006 cf van Welzen *et al.* 2005). The flora of Timor-Leste is characterized by low levels of endemic genera (3) and, at the species level, endemism is estimated at 10.3 percent (Cowie 2006 cf. Monk *et al.* 1997; van Steenis 1979).

Three of Timor-Leste's bird species were identified to be endangered [Timor green pigeon (*Treron psittacea*), local name (LN): Punai Timor; Timor imperial pigeon (*Ducula cineracea*), LN: Pergam Timor; and Wetar ground dove (*Gallicolumba hoetdii*), LN: Delimukan Wetar]; one is critically endangered [Yellow-crested cockatoo (*Cacatua sulphurea*), LN: Kakatua jambulkuning]; and one is vulnerable – Timor sparrow (*Padda fuscata*) LN: Gelatik Timor.

The non-bird fauna of Timor-Leste and its associated islands is poorly known. New species of bats, frogs, geckos and skinks have been recently discovered, and there are available evidence indicating high levels of endemism in all faunal groups. While roughly half of the bird fauna originates from Asia and half from Australasia, the mammal, amphibian and reptile faunas are dominated by Asian families and species (BirdLife International 2007).

Timor-Leste has a total of 30 declared protected areas that contain the majority of the remaining primary forest cover in the country (by the end of 2014, 22 additional protected areas had been identified adding up to a total of 52 protected areas). Majority of these areas are montane and have high species endemism. Nino Konis Santana National Park is Timor-Leste's first national park and is a combination of three national parks, namely, Jaco Island Marine National Park, Lake Iralalaru National Park, and the vicinity of Com.

Timor-Leste is also part of the Coral Triangle, which harbors 76 percent of the world's coral species, six of the world's seven marine turtle species, more than 3,000 species of reef fish, whale sharks, manta rays and a diversity of marine mammals such as 22 species of dolphin, a variety of whale species, and sustains about 120 million people (NEGA 2010, IBA 2007).

Timor-Leste harbors globally significant ecosystems such as tropical rainforest, mangroves, wetlands like the Lake Iralalaru basin, and agricultural and marine ecosystems. Approximately 59 percent of the land area has some type of forest cover, but only 1.7% percent is covered by remaining primary forests found mainly in Lautem and Covalima districts (Democratic Republic of Timor-Leste, 2013a).

For agricultural ecosystems, the main cereal crops include rice and maize while the major cash crop is coffee. Areas under irrigation are small and use of fertilizers is limited. There is very little agro-processing or agricultural diversification. In real terms, agricultural incomes have remained stagnant since 2002. Upland agriculture faces additional challenges in the form of 'slash and burn' methods and loss of soil during heavy rains.

Over 100 rivers originate from the highlands that discharge into the coastal zone. With the steep topography, the discharges are short and fast flowing. There are 29 main river systems—12 in the north and 17 in the south—but very few of these rivers flow year round and often dry out and form pools of stagnant water in the dry season.

Total mangrove cover is confined to the region between Tibar and Manatuto. Recent coastal mapping has revealed significant and ongoing coastal habitat loss in Timor-Leste, particularly in coastal mangroves, mainly due to trees harvested for timber and fuelwood. In some instances, hinterland mangroves have been removed for the establishment of brackish water shrimp and/or fish ponds.

## Status and Trends of Biodiversity in Timor-Leste

*Forest and Mountain Ecosystems.* Between 2003 and 2012, there has been a significant reduction in Timor-Leste's forest cover. Approx. 184,000 ha of forest, i.e. 17.5% of the forest area of 2003, had been lost in that 9-year period. This translates into an average annual deforestation rate of 1.94% (Democratic Republic of Timor-Leste, 2013b). Forest cover in Timor-Leste had decreased by almost 30 percent over the period of 1972 to 1999, based on analysis of satellite images (Sandlund *et al.* 2001). Primary forests around Los Palos and in the Lake Iralalaru basin have been extensively converted into grassland, cropland and secondary forest vegetation. Number of species by life-form was 212 tree species, 84 shrub species, 194 herbaceous species, and 104 vine, 47 fern and 11 epiphyte (non-ferns) species with 67 species still unclassified. At least 262 bird species are known from Timor; 169 are considered resident, 76 regular migrants and 17 vagrants (Trainor *et al.* 2007). Three bird species were identified to be endangered, one critically endangered and one vulnerable.

*Agricultural Ecosystem.* Three-fourths of Timor-Leste's population depend on subsistence agriculture, on which the domestic economy is based. A total of 600,000 hectares or 40 percent of the country's total area is suited for cropping and livestock, but only 30 percent is cultivated. Plains especially along Los Palos are mainly used for grazing. There is very little agro-processing or agricultural diversification and there is fear of genetic erosion of agricultural crops. The main cereal crops are rice and maize, and the major cash crop is coffee. The country has yet to expand its export base in the agriculture sector.

*Wetland and Freshwater Ecosystems.* The country has 29 main river systems but very few of these flow year round. These river systems contain certain catchment areas, which are potential watersheds. Water resources are underutilized because most of the irrigation and reservoir systems are not functional. The more significant wetlands are Lake Iralalaru and Lake Modo Mahut. There are 24 identified key wetland sites, which harbor threatened and near-threatened birds.

*Coastal and Marine Ecosystems.* Timor-Leste is part of the Coral Triangle, and is home to a vast and diverse marine species. Many of these species however, have been identified as endangered, and a number of turtle species are at high risk of extinction. The total mangrove area has been reduced from 9,000 hectares in 1940 to just 1,802 hectares in 2008, equating to a 40 percent loss, mainly due to trees harvested for timber and fuel wood, and the establishment of brackish water shrimp and/or fish ponds. Salt extraction is done in mangrove fringes. Timor-Leste has abundant fish stocks, yet almost all fishing is subsistence or semi-subsistence. Fringing coral reefs form an almost continuous strip along the coastal waters, west of Timor-Leste.

*Protected Area Ecosystem.* Protected areas are integral to the Strategy to address fundamental priorities for sustainable management of the environment, natural resources and biological diversity. The development of policy and legislation specific to protected areas is in process. Timor-Leste's Regulation No. 2000/19 establishes and designates protected areas encompassing large areas of forests, and notes additional objectives of conservation of biodiversity and protection of the biological resources, specifically granting full protection of mangrove forests from cutting, removal or other damages.

Some fauna surveys done since Timor-Leste gained independence were concentrated on birds, while non-bird, land and marine fauna are poorly known. Several limitations include budget and the available staff and technical capacity, a large gap in laws regulating the existing protected areas, the need for stronger implementation mechanisms, and issues on land ownership.

## Drivers of Biodiversity Loss in Timor-Leste

Human exploitation of forest, marine and agricultural resources and unsustainable land management practices has transformed Timor-Leste's natural environment into a predominantly rural agricultural landscape of low productivity and degraded rangelands.

*Forest degradation.* The continued use of fuelwood as the main source of energy for cooking is a major cause of massive forest loss. The average fuelwood consumption in 2010 was estimated to be about 7.3 cubic meters per household. In rural areas, forestry activities that provide cash income for community members include fuelwood gathering, hunting, collection of palm wine, production of palm stem panel for house walling, collection of palm leaves for house roofing, harvesting of rattan and bamboo, thinning, nursery and gathering of honey. Two identified disturbances affecting the health and vitality of the forest include fire and diseases. Comprehensive land use plans and spatial zonation have still to be completed.

*Erosion of agricultural productivity.* Timor-Leste's rural terrain and surfaces are prone to flooding, soil erosion and drought. Agricultural productivity is very low because of insufficient diversification, among other reasons. Upland agricultural challenges include 'slash-and-burn' methods and loss of soil due to heavy rains. Other contributors to low agricultural productivity and high rural poverty are lack of rural infrastructure, recurrent natural disasters and social unrest. Lack of good varieties is one identified constraint to crop production. Other technological factors include water shortages, high weed populations, low soil fertility, and inadequate seed and grain storage. Non-availability of adequate land for cultivation is putting pressure on forests as people cut down trees to meet their need for arable land and fuelwood. Other main issues include invasive alien species, post-harvest rot/decay and the threat of extinction of local rice varieties.

Non-farm rural employment opportunities are practically non-existent, resulting in high underemployment in rural areas and low incomes, forcing people to migrate to cities.

*Degradation of mangroves and coastal areas.* Coastal areas where mangroves are found are subject to high human pressure and some are widely converted to fishponds and other aquaculture activities. Mangroves are illegally cut for house construction, boat-building, and for fuelwood to support salt-making livelihood activities. Sea turtles are overharvested for their eggs, skin, meat and carapace for handicraft making in at least 11 districts in Timor-Leste. Mollusks are also threatened and are being collected for consumption and handicrafts. Corals and mangroves are being threatened with pollution and destructive fishing methods. There is an urgent need for precautionary conservation and management of coral reefs to avoid any reduction in coral and reef fishes.

*Pollution of waters and sedimentation of rivers.* The sedimentation of rivers and streams due to collection of sand and stones in riverbeds affects water quality, leading to the death of river organisms such as fish, shrimps, lobsters, molluscs and eels. Other factors affecting rivers are the discharge of sewage and disposal of solid wastes into waterways, and non-sustainable fishing methods. Shallowing and widening of riverbeds due to erosion have damaged agricultural lands. An intensive study needs to be carried out in order to manage water resources and determine water standards in Timor-Leste. This must be supported by the government through its policies on management and natural conservation of water resources. Protection of forest and protected areas will further contribute to safeguarding the water resources.

*Lack of effective management system for protected areas.* Overall, there is inadequate management system for the 30 declared protected areas. For example, only one manager and six community forest guards manage the country's largest protected area, Nino Konis Santana National Park, which covers a total area of 123,600 hectares of terrestrial and marine areas. This

weak institutional support to protected area management is also coupled by inadequate national laws and regulations, which sometimes conflict with the traditional laws.

### **Integrating Biodiversity into National and Sectoral Plans and Programmes**

All sectors (tourism, agriculture, infrastructure, industry, etc.) must be brought early into the biodiversity conservation and sustainable management process. It is essential that biodiversity considerations be integrated in all relevant national legislation, plans and programmes. The National Biodiversity Strategy and Action Plan examines how national plans have integrated biodiversity concerns. The Strategy recommends ways on how concerted and joint actions will be undertaken to achieve common goals.

Timor-Leste's National Strategic Development Plan (2011 – 2030) has targets that are relevant to the Convention on Biological Diversity global targets: raising peoples' awareness on the values of biodiversity and the steps they can take to conserve and use it sustainably; achieving reduction of rate of loss of natural habitats and conserving biodiversity and ecosystem services through effectively and equitably managed, ecologically representative and well-connected systems of protected areas; minimizing anthropogenic pressures on ecosystems and biodiversity to maintain their integrity and functioning; enhancing ecosystem resilience and the contribution of biodiversity to carbon stocks; and contributing to restoring and safeguarding health, livelihoods and well-being, taking into account the needs of women and children.

### **National Biodiversity Strategy and Action Plan: Priority Actions and Targets**

The Priority Strategies for Biodiversity Conservation in Timor-Leste have been identified based on the needs of the Timorese people and the targets set by the National Strategic Development Plan (2011 – 2030) and the Convention on Biological Diversity. Based on the stakeholders' engagement process, five priority strategies have been identified together with 21 strategic actions. These strategies will be initiated in the short term and implemented by 2020.

The following priority strategies will be implemented with concrete identified targets:

1. Mainstreaming Biodiversity into sectoral plans and programs to address the underlying causes of biodiversity loss
2. Protecting biodiversity and promoting sustainable use
3. Building climate-resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity
4. Enhancing biodiversity and ecosystems services to ensure benefits to all
5. Enhancing implementation of the NBSAP through participatory planning, knowledge management and capacity building, including district and sub-district and community levels

These strategies have the following corresponding priority targets for the period 2011-2015 and the specific groups of strategic actions to achieve these targets (cf. Annex 3 revised):

#### ***Priority Strategy 1: Mainstreaming Biodiversity into sectoral plans and programs to address the underlying causes of biodiversity loss***

Target: By 2015, public awareness on biodiversity has increased and participation in conservation activities through sustainable tourism and sustainable agriculture by private sector, media, and local communities, including women and youth has been enhanced.

1. Raise awareness on the values of biodiversity and engage various sectors including the media, business sector, youth and women groups and local communities in conservation activities
2. Mainstream sectoral plans, policies, and national planning
3. Promote nature-based and community-based sustainable tourism and ecotourism

4. Develop and enforce a sustainable land management and land use policy
5. Ensure impact assessment of development projects through the Environmental Impact Assessment (EIA) system

***Priority Strategy 2: Protecting Biodiversity and Promoting Sustainable Use***

Target: By 2015, rehabilitation activities in critical watersheds and degraded lands have been undertaken and at least one million trees have been planted per year, providing sustainable livelihoods to local communities through ecosystem restoration activities.

6. Enhance and develop a national biodiversity law and relevant environmental policies on nature conservation, pollution and other related concerns, including traditional laws
7. Rehabilitate damaged and critical habitats and ecosystems and degraded watersheds through massive tree planting including mangrove reforestation
8. Assess impacts of invasive species and prevent and control their spread
9. Implement sustainable livelihood activities for local communities, promote traditional conservation knowledge and practices, and enhance the role of women and youth in biodiversity conservation

***Priority Strategy 3: Building climate-resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity***

Target: By 2020, the status of biodiversity has improved through the safeguarding of ecosystems, species and genetic diversity in the 30 declared protected areas.

10. Effectively manage representative samples of Timor-Leste's biodiversity in identified protected areas and create natural conservation zones to protect specific biodiversity and ecosystems
11. Develop and implement a comprehensive and integrated coastal and marine and fisheries management programme and promote responsible and sustainable coastal and marine resources use
12. Develop and implement a comprehensive and integrated agricultural management programme aimed at maintaining plant genetic diversity
13. Develop and implement a waste management programme on composting, recycling, and re-using of domestic, commercial and other wastes

***Priority Strategy 4: Enhancing biodiversity and ecosystems services to ensure benefits to all***

Target: By 2020, ecosystem services have been enhanced through promoting economic values of biodiversity and ecosystems and promoting benefits sharing.

14. Conduct a valuation and accounting of direct and indirect goods and services of biodiversity resources and ecosystems
15. Safeguard and maintain ecosystem services through promoting the Integrated Water Resource Management Plan
16. Develop and promote understanding of national policies on access and benefit-sharing arising from utilization of genetic resources, including biosafety measures

***Priority Strategy 5: Enhancing implementation of the NBSAP through participatory planning, knowledge management and capacity building, including district and sub-district and community levels***

Target: By 2015, a national biodiversity monitoring and reporting system on biodiversity has been established, using the Clearinghouse Mechanism as a platform for information, knowledge management and networking.

17. Enhance technical and managerial capacity of officials and staff on biodiversity conservation and management as laid out in the Strategic Action Plan (SAP) and the Capacity Building Plan on Protected Areas under the PoWPA Project of the MAF (cf. also NBSAP Capacity-building Plan Chapter)
18. Develop an integrated research programme for Timor-Leste and intensify research efforts on the different aspects of forestry, protected areas, agriculture and other ecosystems, such as population studies, ecological studies, water quality assessment, and impact of alien invasive species
19. Maintain and put into operation the Clearing House Mechanism (CHM) as the platform for knowledge sharing and networking
20. Document and promote indigenous and traditional knowledge, techniques and practices for biodiversity conservation and environmental protection
21. Coordinate with donor partners, the United Nations and regional organizations and explore ways to substantially increase levels of funding and develop joint programmes

# CHAPTER 1

## CHAPTER 1

### SETTING THE CONTEXT



# The Wealth of Biodiversity and Drivers of Biodiversity Loss in Timor-Leste

## 1.1 Introduction

Timor-Leste's NBSAP was prepared in parallel with its Fourth National Report to the CBD, which provides a more in-depth assessment of the wealth and threats of biodiversity and the progress achieved so far in implementing the 2010 Biodiversity Target.

The NBSAP is closely anchored on the National Strategic Development Plan (NSDP) of Timor-Leste (2011-2030), a 20-year vision that reflects the aspirations of the Timorese people to create a prosperous and strong nation. The NBSAP is also consistent with other sectoral policy frameworks, such as the National Adaptation Programme of Action (NAPA) on Climate Change (December 2010), the National Action Programme (NAP) to Combat Land Degradation (February 2009), the Fisheries Sector Plan and the Forestry Sector Plan, and the Tourism Development Strategies for Timor-Leste.

The NBSAP examines how national plans (e.g., NSDP, NAPA on Climate Change and NAP on Land Degradation) have integrated biodiversity concerns and recommends strategies on how concerted and joint actions will be undertaken to achieve common goals. The targets set out in Timor-Leste's Strategic Development Plan are very much relevant to conserving biodiversity and achieving sustainable development.

The NBSAP document comes at an opportune time to serve as a roadmap to achieve the environment and sustainable development targets of the NSDP.

The NBSAP uses the ecosystem approach and considers the maintenance of ecosystem services and functions, including among others, provision of food, water and fuel; cultural services; habitat provision; climate regulation, pollination or seed dispersal. The NBSAP is a continuous process in consolidating the aspirations and actions of Timor-Leste towards a sustainable future.

The NBSAP comprises a living planning document that compiles national laws, plans, programs and projects; a biodiversity communication, education and public awareness strategy (CEPA), a Clearinghouse Mechanism (CHM) which serves as a platform for information, knowledge management and networking on biodiversity to aid in policy decision-making; and an NBSAP funding plan to conserve and sustainably use the country's biodiversity in an equitable manner, in the next two decades.

The NBSAP also outlines Timor-Leste's strategy to raise public awareness and ratify and implement the Nagoya Protocol on Access to Genetic Resources and Benefit-Sharing – to achieve the third objective of the CBD. The country would need a systematic capacity building strategy to achieve this, protect its sovereign resources and provide benefits for all Timorese people.

The success of implementing the NBSAP will involve close coordination among the key directorates of government concerned in biodiversity conservation and natural resources

management, other economic sectors of the government and the private sector. It will also involve updating of current programs and setting priorities for programming and funding.

The NBSAP consists of four major sections: (1) the context describing the wealth and threats to biodiversity; (2) the strategy defining the vision and priority strategies; (3) the action plan, specifying the key milestones and includes Timor-Leste's plan for capacity building on biodiversity; and (4) the implementation plan, including the coordinating mechanism and monitoring system. This section features the CEPA strategy to systematically promote the values of biodiversity and the CHM as Timor-Leste's platform for knowledge and information sharing and networking on biodiversity.

## **1.2 The Wealth of Biodiversity in Timor-Leste**

### **1.2.1 Understanding Biodiversity**

Biological diversity or biodiversity is the variety of all life forms. It encompasses three levels of diversity: genetic, species and ecosystems. Genetic diversity is the variety of genetic information contained in individual plants, animals and micro-organisms; species diversity is the variety of species; and ecosystem diversity is the variety of habitats, ecological communities and ecological processes.

The CBD defined biodiversity as the variability among living organisms such as terrestrial, marine and other aquatic systems. Biodiversity is constantly changing and can be increased by genetic changes and evolutionary processes, and it can be reduced by threats, which lead to biodiversity population decline and extinction. Biodiversity is the life-support system for all human beings. It provides food, health, shelter, medicine, fuel, clean air and water, contributes to local livelihoods, and regulates the overall climate system.

The Timorese people depend on natural resources, biodiversity and the functioning of the country's key ecosystems and habitats. Their development priorities to promote agriculture and tourism are highly dependent on natural resources and the natural beauty of Timor-Leste and its landscapes.

### **1.2.2 Globally Significant Biodiversity and Ecosystems in Timor-Leste**

Timor-Leste is home to a number of globally significant ecosystems and endemic species and is positioned in a biodiversity hotspot called Wallacea. This hotspot is situated 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. These high biodiversity regions influence the composition of the flora and fauna found in Timor-Leste. The Malesian region, where Timor-Leste belongs, is recognized as a region of high plant biodiversity with an estimated 41,000 plant species, including 70 percent of species endemic to the region (Roos, et al. 2004; van Welzen, et al. 2005).

The Lesser Sunda Island region where Timor-Leste is found, has plants that also occur in the Kimberley or Northern Territory of Australia. Such plants include *Lepisanthes rubiginosa*, *Melochia umbellata* and *Secamone timorensis*, all on Timor-Leste and known in Australia only from the monsoon forest in northwest Kimberley. Other examples include vine species such as *Cyathostemma glabrum*, *Dichapetalum timorense*; shrubs such as *Hibiscus vitifolius* and *Pentapetes phoenicea*, and tree species such as *Pittosporum moluccanum*, *Santalum album* and *Suregada glomerulata*, which are all known in Timor-Leste, but in Australia are found only in the

Northern Territory. *Eugenia reinwardtiana*, *Garuga floribunda*, *Lagerstroemia archeriana* and *Proiphys amboinensis* all occur in Timor-Leste, the Kimberley and Cape York.

The most recent estimate of the proportion of endemic plant species for the Lesser Sunda Islands (based on families treated in Flora Malesiana) is 5.2 percent, a figure slightly below the average for Malesian phytographic areas (Cowie 2006 cf. van Welzen, et al. 2005). The flora of Timor-Leste is characterized by low levels of endemic genera (three) and at the species level, endemism is estimated at 10.3 percent (Cowie 2006 cf. Monk, et al. 1997; van Steenis 1979).

At least 262 bird species are known from Timor; 169 are considered resident, 76 regular migrants and 17 vagrants (Trainor et al. 2007). Three bird species were identified to be endangered [Timor Green Pigeon (*Treron psittacea*), local name (LN): Punai Timor; Timor Imperial Pigeon (*Ducula cineracea*), LN: Pergam Timor; and Wetar Ground Dove (*Gallinula hoedtii*), LN: Delimukan Wetar]; one is critically endangered – Yellow-Crested Cockatoo (*Cacatua sulphurea*), LN: Kakatua jambulkuning); and one is vulnerable – Timor Sparrow (*Padda fuscata*), LN: Gelatik Timor.

The non-bird fauna of Timor Leste and its associated islands is poorly known with recent surveys discovering new species of bats, frogs, geckos and skinks, but some available evidence indicate that there are high levels of endemism in all faunal groups. While roughly half of the bird fauna originates from Asia and half from Australasia, the mammal, amphibian and reptile faunas are dominated by Asian families and species (BirdLife International 2007).

Timor-Leste has a total of 30 declared Protected Areas (PA), containing the majority of the country's remaining primary forest cover (by the end of 2014, 22 additional protected areas had been identified adding up to a total of 52 protected areas). Majority of these areas are montane and have high species endemism. Nino Konis Santana National Park (NKSNP) is Timor-Leste's first national park and is composed of three national parks, namely, the Jaco Island Marine National Park, the Lake Iralalaru National Park, and the vicinity of Com Village.

Timor-Leste is also part of the Coral Triangle, which harbors 76 percent of the world's coral species, six of the world's seven marine turtle species, more than 3,000 reef fish species, whale sharks, manta rays and a diversity of marine mammals, such as 22 dolphin species and a variety of whale species. The area sustains about 120 million people (NEGA 2010, IBA 2007).

The country also contains globally significant ecosystems such as tropical rainforest, mangroves, wetlands like the Lake Iralalaru basin, and agricultural and marine ecosystems. According to the country's first detailed forest cover maps, 58.9 percent of the land area has some type of forest cover, but only 1.7% percent is covered by remaining primary forests found mainly in Lautem and Covalima districts (Democratic Republic of Timor-Leste, 2013a). Between 2003 and 2012, there has been a significant reduction in Timor-Leste's forest cover. Approx. 184,000 ha of forest, i.e. 17.5% of the forest area of 2003, had been lost in that 9-year period. This translates into an average annual deforestation rate of 1.94% (Democratic Republic of Timor-Leste, 2013b). Forest cover in Timor-Leste had decreased by almost 30 percent over the period from 1972 to 1999, based on analysis of satellite images (Sandlund, et al. 2001).

For agricultural ecosystems, the main cereal crops include rice and maize while the major cash crop is coffee. Few areas are under irrigation and use of fertilizers is limited. There is very little agro-processing or agricultural diversification. In real terms, agricultural incomes have remained stagnant since 2002.

Over 100 rivers originate from the highlands and discharge into the coastal zone. With the steep topography, the discharges are short and fast flowing. Out of the 29 main river systems, 12 are in the north and 17, in the south, but very few rivers flow year round – often drying out and forming pools of stagnant water in the dry season. Total mangrove cover is

confined mainly to the region between Tibar and Manatuto. The detailed assessment of biodiversity and ecosystems in Timor-Leste is presented in Annex 1.

Recent coastal mapping has revealed significant and ongoing coastal habitat loss in Timor-Leste, particularly in coastal mangroves, where trees are being harvested for timber and fuelwood and, in some instances, hinterland mangrove trees have been removed for the establishment of brackish water shrimp and/or fish ponds.

### 1.3 Drivers of Biodiversity Loss

Over exploitation and unsustainable use of natural resources, as well as habitat degradation and fragmentation are the main drivers of biodiversity loss in Timor-Leste. Pollution, invasive alien species, and climate change are also contributing factors to biodiversity loss.

Large-scale deforestation due to growing demand for fuel wood and the absence of alternative sources of energy has caused the continued decline of forest cover. Soil depletion in upland areas is heavy due to the widespread practice of 'slash and burn' farming methods. Sandlund, et al. (2001) reported that forest cover in Timor-Leste has decreased by almost 30 percent from 1972 to 1999. Only about 59 percent of the land area has some type of forest cover and the remaining primary forest vegetation is estimated at 1.7 percent (Democratic Republic of Timor-Leste, 2013a). The country has no sufficient timber for rebuilding and firewood. Assessment of areas of the different forest categories from 1990 to 2005 showed a decreasing area for modified natural forests but increasing areas for productive plantations. The trends in forest area from 1990 to 2010 showed an approximate decrease of 2000 square kilometers over a 10-year period (See Annex 1-The Natural Environments, Biodiversity and Ecosystems in Timor-Leste).

The management system of established PAs is currently inadequate. Most PAs that have been declared have no management plan and lack institutional mechanisms for effective management.

Subsistence agriculture is the main source of livelihood and up to 90 percent of Timorese people depend on natural resources. The agriculture sector is challenged by lack of good varieties of agricultural crops, water shortages, weeds and low soil fertility. Storage of seed and grain is also a problem. Lack of adequate land for cultivation puts pressure on forests and forces people to cut down trees to have 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, Liquica, Baucau, Ainaro/Maubisse, Manatutu, Bobonaro and Viqueque where their main crops are rice, maize, cassava, coconut, potato and cabbage.

Upland agriculture faces additional challenges in the form of the 'slash and burn' method of farming that generally results in loss of soil during heavy rains.

Collection of sand and stones along riverbanks, discharging of sewage, and disposal of solid wastes into the waterways are all contributing to the sedimentation of rivers and streams that ultimately affect water quality. Non-sustainable fishing methods also bring threats to aquatic ecosystems.

Timor-Leste is highly vulnerable to multiple natural disasters, as well as the negative impacts of climate change. During dry months, water becomes scarce especially in the Betano region and the northern coast of the Tutuala region. When the whole of Timor-Leste dries up, a severe water crisis occurs especially for irrigation and clean water. These environmental circumstances and the heavy reliance on a limited range of economic resources will worsen the

country's vulnerability to climate change. A proactive approach and investments in disaster prevention, mitigation, preparedness and response would reduce disaster risks and contribute to biodiversity conservation.

From January to June 2011, Timor-Leste experienced 91 small- to medium- scale disaster events in several districts and sub-districts, such as in Dili, Baucau, Ermera, Lautem, Liquica, Manatuto, Manufahi, Oecusse and Viqueque. It is strongly possible that many sucos in these districts are affected by the negative impacts of these events, which could result in low cultivation of agricultural products.

In 2007, the Fourth Constitutional Government of Timor-Leste formulated the National Disaster Risk Management Policy to guide in the identification of the government's development priorities, objectives and strategies in disaster risk management (Meutia, 2011). The NAPA on Climate Change has identified key strategies to adapt to the impacts of natural disasters through: improving institutional and community (including vulnerable groups such as women and children) capacity to prepare for and respond to natural disasters induced by climate change; maintaining and restoring mangrove and forests; and promoting awareness raising to protect coastal ecosystems and forests from climate change impacts.

The high rate of population growth is another major challenge facing Timor-Leste. The average fertility rate of 7.8 births per woman poses serious social and economic problems for the Timorese people. At present, infrastructure requirements for water sourcing and distribution are inadequate for the needs of the local population for clean water and sewage disposal. Urban areas like Dili (Timor-Leste's capital) may face health risks due to lack of water and sewage treatment facilities, appropriate solid waste recycling and disposal systems. Aquatic habitats such as dry riverbeds and coastal areas are similarly at risk from sewage discharge and garbage. Human activities have impacted heavily on the extent and condition of the natural vegetation.

The overall lack of information on environment and biodiversity such as hydrology, water catchment and wetland areas hinders a well-informed decision making and hampers conservation activities.

Recent coastal mapping has revealed significant and ongoing coastal habitat loss in Timor-Leste, particularly in coastal mangroves. This habitat loss is mainly due to trees harvested for timber and fuel wood and, in some instances, conversion of hinterland mangroves to brackish water shrimp and/or fish ponds.

Major concerns in biodiversity and its conservation in the various ecosystems include habitat degradation and fragmentation, overexploitation, pollution and solid waste management, as well as weak legal instruments. Table 1 presents the issues that have been validated during the NBSAP consultation process.

**Table 1: Identified Problems, Issues and Threats by Ecosystem and Their Proposed Solutions**

Ecosystem	Problems/Issues/Threats	Proposed Strategies
Freshwater and Inland Ecosystem	<ul style="list-style-type: none"> <li>There is deteriorating inland aquatic environment due to land degradation and sedimentation, illegal cutting of trees and nomadic farming, collection of sand and stones, disposal of sewage and solid wastes into the aquatic environment, and building of infrastructure in non-designated areas.</li> </ul>	<p>Develop and implement a threats-based approach to improving inland aquatic ecosystem health in critical districts of Timor-Leste and include restoring habitats, enforcing specific policies, and promoting environment-friendly resource use practices.</p>
	<ul style="list-style-type: none"> <li>There is conflict of interest between government and land owners, and government and communities particularly in Malahara and Buiquiria.</li> </ul>	<p>Encourage community to support conservation and management of inland waters of Timor-Leste through socialization (community level environmental education campaigns), coupled with environment-appropriate income-generating livelihoods.</p>
	<ul style="list-style-type: none"> <li>There is lack of laws and regulations on the management of ecotourism activities.</li> </ul>	<p>Advocate for and promote the development of locally relevant natural resource management policies.</p>
Marine and Coastal Ecosystem	<ul style="list-style-type: none"> <li>The Lenuk (turtle) is threatened with overharvesting for its eggs, skin and meat.</li> </ul>	<p>Promote responsible and sustainable coastal and marine resource uses to eliminate sources of threats such as pollution, deforestation of mangroves and unsustainable means of fishing.</p>
	<ul style="list-style-type: none"> <li>Mangroves are threatened with deforestation due to illegal cutting for house construction and fishing boat building.</li> </ul>	
	<ul style="list-style-type: none"> <li>Bats are threatened with hunting activities particularly in Lore, Metinaro, Illiomar, Suai and Bemalae.</li> </ul>	
	<ul style="list-style-type: none"> <li>Molluscs are collected for local consumption and handicrafts.</li> </ul>	
	<ul style="list-style-type: none"> <li>Corals are threatened with pollution and destructive fishing activities particularly in Behau, Tasitolu, Com,</li> </ul>	

Ecosystem	Problems/Issues/Threats	Proposed Strategies
	<p>Baucau, Cristo Rei, Jaco Island and Metinaro.</p> <ul style="list-style-type: none"> <li>Fisheries management strategies may not be effective and need updating.</li> </ul>	
Agriculture Ecosystem	<ul style="list-style-type: none"> <li>In the localities of Maliana, Liquica, Baucau, Ainaro/Maubisse, Manatuto, Bobonaro and Viqueue where the main resources are rice, maize, cassava, coconut, potato, buffalo, and cabbage, the main concerns are pest infiltration and destruction, low production, <i>'slash and burn'</i>, invasive alien species, post-harvest rot/decay and the threat of the extinction of rice varieties.</li> <li>In the locality of Maliana where the major crop is rice, the main concern is locust infestation, which causes low rice production.</li> <li>In the locality of Liquica where the main resources are maize and cassava, the main concern is the practice of <i>'slash and burn'</i>.</li> <li>In the locality of Baucau where the main resource is coconut, the main concern is pests and diseases.</li> <li>In the localities of Ainaro/Maubisse where the main resource is potato, the main concern is fungi (<i>Fusarium</i> sp.).</li> </ul>	Promote effective management strategies and activities for the protection and sustainable use of agricultural crops.
Agriculture Ecosystem	<ul style="list-style-type: none"> <li>In Manatuto, the main resource is buffalo, and the main concerns, among others, are <i>Chromolaena odorata</i>, tourism and nutrition.</li> </ul>	Promote effective management strategies and activities for the protection and sustainable use of agricultural crops.

Ecosystem	Problems/Issues/Threats	Proposed Strategies
	<ul style="list-style-type: none"> <li>• In the locality of Bobonaro where the main resource is cabbage, the main concern is post-harvest decay through decay and rot.</li> <li>• In the locality of Viqueque where the main resource is rice (local varieties are red and black rice), the main concern is the extinction of rice varieties.</li> </ul>	
Forest and Mountain Ecosystem	<ul style="list-style-type: none"> <li>• There is pest and disease infestation of agroforestry crops in communities living in mountains and near forest ecosystems.</li> <li>• There is illegal cutting and destructive logging.</li> <li>• Burning of land is prevalent</li> <li>• Nomadic farming due to low fertility of soil in their respective areas results in low yield.</li> <li>• There is illegal hunting, illegal wildlife trade and hunting for nutmeat.</li> <li>• Poaching of wildlife resources is done for food, medicine and ornaments.</li> <li>• There are sewage outflows and unmanaged sewage and trash.</li> <li>• There is land-based erosion due to development activities.</li> <li>• There are conflicts of interest in communities.</li> </ul>	<p>Promote effective management of PAs and address the sustainable livelihood needs of communities.</p> <p>Improve capacity building and institutional governance of organizations from the national to the local levels.</p> <p>Implement CEPA activities to disseminate information on sustainable technologies and strategies for effective natural resources management.</p>
Grassland Ecosystem	<ul style="list-style-type: none"> <li>• There is illegal hunting of wildlife.</li> <li>• There is burning of grasslands.</li> <li>• There is encroachment of settlements into grassland ecosystems.</li> <li>• There is presence of</li> </ul>	<p>Promote effective management of PAs and address the sustainable livelihoods of communities.</p> <p>Improve capacity building and institutional governance of organizations from the national to the local levels.</p>

Ecosystem	Problems/Issues/Threats	Proposed Strategies
	<p>livestock diseases.</p> <ul style="list-style-type: none"> <li>• Grasslands are destroyed.</li> <li>• There is encroaching due to extensive farming.</li> <li>• There are community housing/settlements.</li> <li>• Industry and commercial development encroaches on habitats of wildlife.</li> <li>• There are uncontrolled coconut diseases.</li> <li>• Landslide occurs during strong rains.</li> </ul>	<p>Implement CEPA activities to disseminate information on sustainable technologies and strategies for effective natural resources management.</p>
Protected Areas	<ul style="list-style-type: none"> <li>• In the locality of PN NKS Lautem, Mundo Perdi (Viqueque), Tata Mailau/Ainaro, Mota Clere/Lake of Modo Mahut Same and Manukoko (Atauro) where the main resources are forestry, fishery, culture, tourism (historical place of resistance, cultural festivals, rituals), ecotourism (springs, sands, stones), fauna, and minerals (gold), the main concerns are illegal cutting of trees, illegal hunting and fishing, land degradation and nomadic farming.</li> <li>• There is conflict of interest between the government and land owners, the government and communities in Malahara (sub district Los Palos) and Buiquiria Salt Lake (sub district Laga/Baucau).</li> </ul>	<p>Promote effective management of protected areas, bearing in mind the important role of policy and legislative development in every aspect of environmental conservation and sustainability.</p> <p>Conduct activities on capacity building, education and awareness raising, reforestation, and promotion of ecotourism, keeping in mind the need to conserve and protect the environment.</p>

Source: Report of NBSAP Consultation Workshop: Integrated Workshop Output Using a Perception Mapping Methodology, 31 March-1 April 2011, NBSAP Project, Timor-Leste

## 1.4 Policy Framework and the Governance of Biodiversity

### 1.4.1 Policy Framework

The Constitution of Timor-Leste clearly recognizes the role and importance of natural resources together with the protection of the environment. Section 61 of the Constitution states that

*“Everyone has the right to a humane, healthy, and ecologically balanced environment and the duty to protect it and improve it for the benefit of the future generations”.*

The Constitution also provides that the State shall recognize the need to preserve and rationalize natural resources and shall promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy.

National policies on environment and natural resources are covered by laws and regulations formulated under the United Nations Transitional Administration in East Timor (UNTAET), such as laws promulgated in 2000 on the Prohibition of Logging Operations and the Export of Wood from East Timor and the Law on Protected Areas. Government regulations were also issued in 2007 on the creation of Nino Konis Santana National Park and on the National Forestry Strategy and Policy.

In February 2011, Timor-Leste enacted the Environmental Licensing Decree (Law No. 5) creating a system of environmental licensing for public and private projects likely to produce environmental and social impacts on the environment. The licensing system is based on assessing the size and potential environmental impacts of projects, taking into account their nature, size, technical characteristics and location. The law demonstrates Timor-Leste’s resolve to prevent negative environmental and social impacts of development projects.

Timor-Leste is also in the process of developing a Biodiversity Decree Law, which would set out the national policy on: (1) biodiversity planning, monitoring, and inventory; (2) protection and conservation of ecosystems, habitats and species; (3) addressing threats to biological diversity and resources; (4) addressing *ex-situ* conservation and permitting systems for prohibited activities; (5) addressing genetic resources, traditional knowledge and access and benefit sharing; and (6) addressing biodiversity information management, education and public awareness, training and research, incentives and valuation of biological resources. The development of the Biodiversity Decree started in 2010 with support of the United Nations Environment Programme (UNEP) and will undergo a series of consultation processes involving various sectors.

Annex 2 presents a more detailed analysis of environmental laws and policies governing forest policies, coastal and marine policies, water policies and climate change. Annex 2 likewise provides biodiversity-related provisions of the various sectoral plans and strategies of Timor-Leste.

*National and Sectoral Plans and Programmes.* The National Strategic Development Plan (2011-2030) of Timor-Leste is a 20-year vision that reflects the aspirations of the Timorese people to create a prosperous and strong nation. The Plan covers three key areas: social capital, infrastructure development and economic development. The Plan also envisions Timor-Leste to have joined the ranks of upper-middle-income countries, having ended extreme poverty, eliminated the economic gap with the emerging economies of ASEAN, and fostered a democratic and environmentally sustainable society, by 2030.

Specifically, the SDP envisions that by 2030 a strong bond between Timorese people and the environment will be restored and the natural resources and the environment managed

sustainably for the benefit of all. The protection of biodiversity, key habitats and ecosystems are part of the Plan.

**Strategic Development Plan (2011-2030): Targets Related to National Biodiversity Strategies**

<i>Short Term (2011-2015)</i>
<ul style="list-style-type: none"> <li>▪ An environmental basic law will be the legal framework to protect and</li> <li>▪ conserve the environment.</li> </ul>
<ul style="list-style-type: none"> <li>▪ A designated national authority for the mechanisms of the Kyoto Protocol and a national climate change center will be made operational.</li> </ul>
<ul style="list-style-type: none"> <li>▪ A national biodiversity law and a wildlife conservation law will protect and conserve biodiversity in Timor-Leste.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Air, noise, soil pollution and vehicle emissions regulations will be in place.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Community-based nurseries will be established to ensure planting of one million trees nationwide every year.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Public awareness of environmental protection will be enhanced.</li> </ul>
<i>Medium Term (2015-2020)</i>
<ul style="list-style-type: none"> <li>▪ Seventy percent of the National Adaptation Programmes of Actions under the United Nations Framework Convention on Climate Change will be implemented.</li> </ul>
<ul style="list-style-type: none"> <li>▪ No families in Dili will have to cook with firewood.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Timor-Leste will have an extensive network of land and marine national parks that protect representative samples of our biodiversity.</li> </ul>

These targets are very much relevant to CBD global targets: raising peoples’ awareness on the values of biodiversity and the steps they can take to conserve and use it sustainably; achieving reduction of rate of loss of natural habitats and conserving biodiversity and ecosystem services through effectively and equitably managed, ecologically representative and well-connected systems of protected areas; minimizing anthropogenic pressures on ecosystems and biodiversity to maintain their integrity and functioning; enhancing ecosystem resilience and the contribution of biodiversity to carbon stocks; and contributing to restoring and safeguarding health, livelihoods and well-being, taking into account the needs of women and children.

Timor-Leste’s NBSAP also considered existing regional and national plans 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. Timor-Leste’s CHM on biodiversity (Chapter 4) has been designed to serve as platform in linking information and knowledge from these regional and global initiatives, in addition to enhancing coordination among government agencies, academe, civil society, private sector and local communities.

At the sectoral level, the NBSAP is anchored on key biodiversity documents of Timor-Leste: the National Ecological Assessment (NEGA) Report, May 2011; the Strategic Action Plan and Capacity Building Plan for the Programme of Work on Protected Areas, 2011; the National Action Programme (NAP) to Combat Land Degradation, 2009; the CTI National Plan of Action on Coral Reefs and Fisheries, as well as the Fisheries Law, Water Policy, tourism sector priority sites and previous UNTAET Regulations governing the first national park declared in Timor-Leste. The NBSAP also considered the priority strategies in the Tourism Development Strategies for Timor-Leste.

*Traditional Laws and Practices.* There are traditional regulations and customs in Timor-Leste that contribute to conserving the natural resources such as forests and crops. This system of communal protection is known as *Tara bandu*.

*Tara bandu* is an agreement within a community to protect a special area or resource for a period of time. It is usually carried out for the harvest of agricultural produce, cutting of trees or collecting of forest products, and hunting or fishing but is being used as well to regulate social behavior.

In agriculture, *Tara bandu* involves an object, which is hung near a fruiting tree or garden to indicate custodianship of the resource. It may be a piece of rattan tied around the trunk of the mango tree; or the banned items are hung from a t-shaped bamboo. It is widely believed that people who steal the goods that are the subject of *Tara bandu* will suffer from an accident, misfortune or illness. Villagers designated as *cab-leha/tobe* are responsible for ensuring that village laws are followed (Sandlund *et al.* 2001). *Tara bandu* also includes temporary prohibitions on resource extraction such as cutting of trees, including mangroves, and the designation of specific areas as sacred like Jaco Island and its surrounding reef, which are considered sacred by the local community. *Tara bandu* prescribes fines for violations and also provides for mediation of land disputes (SOL, 2009).



**Tara Bandu**

A ceremonial activity is a feature of contemporary agriculture across Timor-Leste and highlights the continuing vitality and significance of customary beliefs and obligations for households as members of ritual practices. Ritual beliefs and practices may also affect farmer interest and adoption of new technology, such as new seed or cultivation techniques, although most rituals are tied to the stages of development that a plant passes through.

The common practice of presenting food as gift throughout Timor-Leste strengthens social networks between an extended family and neighbors who are non-kin and helps to secure access to food. Successes in restoring ecological systems have been documented by some non-government organizations such as Haburas Foundation in relation to community support for livelihood activities.

*International Agreements.* In recognition of the importance of environmental governance beyond national boundaries and its linkage to achievements of the MDGs, Timor-Leste has signed and ratified the following multilateral environmental agreements:

Multilateral Environmental Agreement	Date Ratified
UN Convention on Biological Diversity (CBD)	January 2007
UN Framework Convention on Climate Change (UNFCCC)	January 2007
Kyoto Protocol to the UNFCCC	January 2009
UN Convention to Combat Desertification (UNCCD)	April 2006
Vienna Convention for the Protection of the Ozone Layer	September 2009
Montreal Protocol on Substances that Deplete the Ozone Layer	September 2009

As a signatory to these agreements, Timor-Leste hopes to fulfill its commitments to address the global environmental issues and as a nation, benefit from international funding and technical support mechanisms set up under these treaties. The country is also preparing to sign the newly approved Nagoya Protocol on Access and Benefit Sharing (ABS) on Genetic Resources.

As a Party to the CBD, Timor-Leste has participated in various CBD Meetings organized by the CBD Secretariat and other international organizations to build its capacity and knowledge on global and regional developments. Timor-Leste is also accessing various funds such as the Global Environment Facility (GEF) and other climate change funding facilities. Timor-Leste has undertaken a multi-stakeholder engagement process in preparing its NBSAP to ensure that the needs and problems of the Timorese people will be reflected and addressed in its conservation strategy.

Timor-Leste has a designated CBD Focal Point and GEF Focal Point, both lodged at the Ministry of Economy and Development. To address the multi-faceted requirements of the CBD, Timor-Leste is committed to undertake a multi-stakeholder mechanism to coordinate and implement the NBSAP.

#### 1.4.2 Governance of Biodiversity and Natural Resources Management

The responsibility in the governance of biodiversity in Timor-Leste is primarily lodged at the Ministry of Economy and Development (MED) and the Ministry of Agriculture and Fisheries (MAF).

The MED through the Secretariat for Environment (SEMA) and the National Directorate for Environmental Services (DNMA) is the lead government agency of Timor-Leste responsible for coordinating biodiversity conservation, in close coordination with the Ministry of Fisheries and Agriculture (MAF). As such, the MED led the NBSAP process and is responsible for monitoring the implementation of the Biodiversity Strategy. The MED also leads the National Biodiversity Working Group (NBWG), a multisectoral body composed of representatives from various ministries and directorates, primarily from the Ministry of Agriculture and Fisheries, Ministry of Industry, Tourism and Trade, other government agencies, including civil society and the academe. The MED and the NBWG are responsible for the monitoring and review of the implementation of the NBSAP and reporting to the Council of Ministers.

The implementation of NBSAP and its progress reporting will form part of the reporting of achievements of Timor-Leste's Strategic Development Plan and the submission of reports to the UN Convention on Biological Diversity, as a Party to the Convention.

The summary of functions related to biodiversity, of the Ministry of Economy and Development and the Ministry of Agriculture and Fisheries and its various directorates are summarized below:

<b>Ministry of Economy and Development</b>	<u>The Ministry of Economy and Development</u> is responsible for promoting, monitoring and supporting strategies for environment mainstreaming in sectoral policies. Within the Ministry is the Secretariat for the Environment, which was established in 2007. The Secretariat has two main Directorates: the National Directorate for Environmental Services and the National Directorate for International Environmental Affairs. These are the key agencies involved in natural resources management and biodiversity, including fulfilling commitments to multilateral environmental conventions, such as the CBD and the UNFCCC where Timor-Leste is a party. The CBD Focal Point in Timor-Leste is
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	<p>with the National Directorate for Environmental Services while the GEF Operational Focal Point is with the National Directorate for International Environmental Affairs.</p>
	<p><u>The Secretariat of the Environment</u> is (SEMA) focused on the implementation of climate change strategies, biodiversity conventions, environmental education and national parks and protected areas.</p>
	<p><u>The National Directorate for the Environment (DNMA)</u> is in charge of undertaking studies, executing and monitoring environmental development, protection and conservation policies, as well as preparing and overseeing the application of environmental regulations and standards. Among other functions, DNMA is responsible for: (1) devising, executing, developing and assessing the environmental policy in line with sustainable development principles, by harmoniously integrating the environmental, socio-cultural and economic component into all other sectoral policies; and (2) developing, in conjunction with the relevant parent organizations, policy to protect marine and land life, in order to avoid their destruction and turn these into centers of natural and tourist attraction in the future.</p>
	<p><u>The National Directorate for International Environmental Affairs (DNAAI)</u> is in charge of stimulating and coordinating the active participation of the Timor-Leste government in international fora, preparing and formulating positions to be adopted in connection with environmental issues, as well as fostering cooperation and collaboration to promote sustainable and environmental development, without prejudice to the specific competencies of the Ministry of Foreign Affairs.</p>
<p><b>Ministry of Agriculture, Forestry and Fisheries</b></p>	<p><u>The Ministry of Agriculture, Forestry and Fisheries</u> covers the sectors on agriculture, forestry, livestock breeding and fisheries and is responsible for: (1) proposing policy and drawing up the proposed regulations necessary for its areas of oversight; (2) managing agricultural and forestry resources and watersheds; (3) managing National Parks and Protected Areas; and (4) ensuring the implementation and continuity of programmes for rural development, in coordination with the Ministry of the Economy and Development. Under this Ministry are the National Directorate for Fisheries and Aquaculture (NDFA) and the National Directorate for Forestry (NDF).</p>
	<p><u>The National Directorate of Agriculture and Horticulture</u> is responsible for carrying out policies within the fields of agriculture and horticulture, genetic plant resources, materials for multiplying plant and vegetable varieties, training rural agents, and providing for the enhancement and economic diversification of rural areas.</p>

	<u>The National Directorate for Fisheries and Aquaculture</u> is responsible for drawing up, coordinating, scheduling, executing and enforcing policies, plans, programmes and projects for fishing, aquaculture, the transformation industry and others allied with it.
	<u>The National Directorate for Forestry</u> is responsible for drawing up, following up, implementing and enforcing forestry policy, specifically in the fields of sustainable development of forest resources and their associated spaces and, additionally, hunting, beekeeping, and aquatic resources in inland waters, thereby guaranteeing their protection, conservation and management. The National Directorate of Forests is also responsible for the management of national parks and fauna and flora.
	<u>The National Directorate for Policy and Planning (NDPP)</u> supports the setting of the strategic directions, priorities and objectives for MAF policies, as well as coordinating, following up, and assessing their application, and ensuring the Ministry's relationships for national and international cooperation.
Source: <a href="http://www.unmit.org/legal/RDTL-Law/index-e.htm">http://www.unmit.org/legal/RDTL-Law/index-e.htm</a>	

The Ministry of Economy and Development and the Ministry of Agriculture and Fisheries report to the Council of Ministers through the Office of the Prime Minister, which approves all policy issuances by the executive department. For example, the NBSAP and the NAPA as national policy documents will be approved by the Council of Ministers.

Other relevant national agencies are the National Directorate of Land, Property and Cadastral Surveys under the Ministry of Justice; the National Tourism Directorate under the Ministry of Trade, Tourism and Industry; and the Ministry of Infrastructure. Non-government organizations and the academe are also actively engaged in biodiversity conservation and other environment advocacies and research.

<b>Ministry of Justice</b>	
<b>National Directorate of Land, Property and Cadastral Surveys</b>	The National Directorate plans and allocates government land for residential, agricultural and other land uses.
<b>Ministry of Trade, Tourism and Industry</b>	
<b>National Tourism Directorate</b>	The Tourism Directorate designs, implements and evaluates national tourism policy, including the aspects of leisure, fun and ecotourism. The Directorate also implements and enforces legislation concerning the installation, licensing, sorting and checking of the status of operation of tourist facilities.
<b>Ministry of Infrastructure</b>	
<b>Secretary of State for Electricity, Water and</b>	The Secretary of State for Electricity, Water and Urbanization ensures the implementation of legal and regulatory

<b>Urbanization</b>	framework related to electrical supply, water resource management and licensing of urban constructions.
<b>Secretary of State for Public Works</b>	The Secretary of State for Public Works reviews and approves development application and public infrastructure (roads and bridges) development inspection.

Non-government organizations engaged in biodiversity conservation and sustainable livelihoods include *Haburas Foundation, Santalum, Timor Verde, Forum ONG Timor-Leste, Caritas*, while academic institutions active in the NBSAP process and other environment activities include *Timor-Leste National University of Timor-Leste* and *Dili Institute of Technology*. During the NBSAP process, media practitioners were also engaged. They represented *The Dili Weekly* and the *Center for Journalista Investigador Timor-Leste*.



# CHAPTER 2

## CHAPTER 2 THE BIODIVERSITY STRATEGY



# Strategy and Action Plan

## 2.1 Vision

Consistent with Timor-Leste's Strategic Plan for 2011-2030 and based on an inclusive stakeholder consultation process, the NBSAP of Timor-Leste has the following vision statement:

***By 2020, Timor-Leste's biodiversity is conserved and wisely used by all sectors, providing food security and contributing to poverty eradication and improved quality of life of Timorese People.***

## 2.2 Guiding Principles Governing the Strategy

*Consistency and integration with national development and sectoral plans.* The NBSAP is anchored on the national Strategic Development Plan (SDP) and is Timor-Leste's key instrument for environmentally sound and sustainable development towards building its core infrastructure, human resources and industries.

The strategies and actions set out in Timor-Leste's SDP aim to develop the country from a low income to upper middle income country, with a healthy, well-educated and safe population by 2030. The NBSAP will provide a road map and strategy to value, conserve and wisely use its biological resources and ecosystems towards providing food security and reducing poverty through developing its agriculture sector, tourism industry and oil and gas sector, among other development priorities:

- Timor-Leste will be proud and supportive of its magnificent biodiversity and natural environment.
- Timor Leste will take steps to adapt to, and be resilient to, long-term climate change, e.g., by fostering large-scale use of irrigation to protect agriculture from fluctuations in rainfall.
- Precautions will be taken to prevent loss of lives and property from floods and extreme storms that may well accompany a changing climate.
- The tourism and petroleum sectors will be developed with great attention and protection of the natural environment, so that development does not compromise the natural beauty or the ecosystem functions of the country.

*Multi-stakeholder Consultation and Engagement in the NBSAP Process.* With the leadership of the Ministry of Economy and Development (MED) and the Ministry of Agriculture and Fisheries (MAF), the NBSAP development process was based on multi-stakeholder engagement and consultations involving various national agencies, non-government organizations, academe and local communities. A Perception Mapping Exercise and Focus Group Discussions in selected districts were conducted. The National Biodiversity Working Group (NBWG) met in a series of formal and informal consultation meetings and discussed the proposed priorities and actions

for the NBSAP. A high-level policy dialogue was convened by the Minister of Economy and Development in July 2011 and discussed the framework and priorities for the NBSAP.

*Alignment with CBD Strategic Plan 2011-2020 and other regional cooperation framework.* The CBD Strategic Plan for Biodiversity serves as a flexible framework for the establishment of national and regional targets. It promotes the coherent and effective implementation of the three objectives of the CBD and served as basis for the NBSAP for Timor-Leste.

The NBSAP of Timor-Leste for the period 2011-2020 took guidance from the New Strategic Plan of the CBD (2011-2020) adopted in Nagoya, Japan at the Tenth Meeting of the Conference of the Parties (COP) to the CBD.

## 2.3 Priority Strategies and Targets

The priority strategies for biodiversity conservation in Timor-Leste were identified on the basis of the needs of the Timorese people, consistent with the country's strategic development priorities and the globally agreed strategic goals of the CBD. Based on the NBSAP stakeholders' engagement process, five priority strategies have been identified together with 21 strategic actions for implementation until 2020.

The five priority strategies will be implemented with concrete identified targets. These Priority Strategies are:

Priority Strategy 1	Mainstreaming biodiversity into sectoral plans and programmes to address the underlying causes of biodiversity loss
Priority Strategy 2	Protecting biodiversity and promoting sustainable use
Priority Strategy 3	Building climate-resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity
Priority Strategy 4	Enhancing ecosystems functioning and providing benefits for all
Priority Strategy 5	Enhancing implementation of the NBSAP through participatory planning, knowledge management and capacity building, including at the district and sub-district and community levels

These priority strategies have the following corresponding priority targets for the period 2011-2015:

Target 1	By 2015, public awareness on biodiversity has increased and participation in conservation activities (through sustainable tourism and sustainable agriculture) by private sector, media, and local communities, including women and youth has been enhanced
Target 2	By 2015, rehabilitation activities in critical watershed and degraded lands have been undertaken and at least one million trees have been planted per year, providing sustainable livelihoods to local communities through ecosystem restoration activities
Target 3	By 2020, the status of biodiversity has improved by safeguarding

	ecosystems, species and genetic diversity in the 30 declared protected areas
Target 4	By 2020, ecosystems services have been enhanced through promoting economic values of biodiversity and ecosystems and promoting benefits sharing
Target 5	By 2015, a national biodiversity monitoring and reporting system has been established using the clearing house mechanism as an operational tool

To achieve the targets, specific strategic actions were identified for each of the five priority strategies. The following specific strategic actions will be prioritized for the period from 2011 to 2015.

### Priority Strategy 1: Mainstreaming biodiversity into sectoral plans and programmes to address the underlying causes of biodiversity loss

Target: By 2015, public awareness on biodiversity has increased and participation in conservation activities (through sustainable tourism and sustainable agriculture) by private sector, media, and local communities, including women and youth has been enhanced

Strategic Action 1	<ul style="list-style-type: none"> <li>▪ Raise awareness on the values of biodiversity and engage various sectors including media, business sector, youth and women groups and local communities in conservation activities by implementing the CEPA Strategy</li> </ul>
Strategic Action 2	<ul style="list-style-type: none"> <li>▪ Promote nature-based and community-based sustainable tourism and ecotourism</li> </ul>
Strategic Action 3	<ul style="list-style-type: none"> <li>▪ Integrate biodiversity into agriculture to ensure the development of diverse and sustainable crops and sustainable agricultural practices</li> </ul>
Strategic Action 4	<ul style="list-style-type: none"> <li>▪ Develop and enforce a sustainable land management and land use policy</li> </ul>
Strategic Action 5	<ul style="list-style-type: none"> <li>▪ Ensure impact assessment of development projects through the EIA system</li> </ul>

### Priority Strategy 2: Protecting Biodiversity and Promoting Sustainable Use

Target: By 2015, rehabilitation activities in critical watersheds and degraded lands have been undertaken and at least one million trees planted per year, providing sustainable livelihoods to local communities through ecosystem restoration activities

Strategic Action 6	<ul style="list-style-type: none"> <li>▪ Enhance and develop a national biodiversity law and relevant environmental policies on nature conservation, pollution and other related concerns, including traditional conservation laws and practices</li> </ul>
Strategic Action 7	<ul style="list-style-type: none"> <li>▪ Intensify massive tree planting including mangrove reforestation to rehabilitate critical and damaged habitats and ecosystems and degraded watersheds</li> </ul>

Strategic Action 8	<ul style="list-style-type: none"> <li>Assess impacts of invasive species and prevent and control the spread of these invasive species</li> </ul>
Strategic Action 9	<ul style="list-style-type: none"> <li>Implement sustainable livelihood activities for local communities, promote traditional knowledge and practices, and enhance the role of women and youth</li> </ul>
<b>Priority Strategy 3: Building climate-resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity</b>	
Target: By 2020, the status of biodiversity has improved by safeguarding ecosystems, species and genetic diversity in the 30 declared protected areas	
Strategic Action 10	<ul style="list-style-type: none"> <li>Effectively manage representative samples of Timor-Leste's biodiversity in the 30 declared Protected Areas and creating natural conservation zones to protect specific biodiversity and ecosystems</li> </ul>
Strategic Action 11	<ul style="list-style-type: none"> <li>Develop and implement a comprehensive and integrated coastal and marine policy and fisheries management programme</li> </ul>
Strategic Action 12	<ul style="list-style-type: none"> <li>Maintain plant genetic diversity through developing and implementing a comprehensive and integrated agricultural management program</li> </ul>
Strategic Action 13	<ul style="list-style-type: none"> <li>Establish waste management center for composting, recycling, and re-using of domestic, commercial and other wastes</li> </ul>
<b>Priority Strategy 4: Enhancing biodiversity and ecosystems services to ensure benefits for all</b>	
Target: By 2020, enhanced ecosystems services through promoting economic values of biodiversity and ecosystems and promoting benefits sharing	
Strategic Action 14	<ul style="list-style-type: none"> <li>Value and account direct and indirect goods and services of biodiversity and ecosystems</li> </ul>
Strategic Action 15	<ul style="list-style-type: none"> <li>Safeguard and maintain ecosystems services through promoting Integrated Water Resource Management</li> </ul>
Strategic Action 16	<ul style="list-style-type: none"> <li>Promote understanding and develop national policies on access and benefitsharing arising from utilization of genetic resources, including biosafety measures</li> </ul>
<b>Priority Strategy 5: Enhancing implementation of the NBSAP through participatory planning, knowledge management and capacity building, including district and sub-district and community levels</b>	
Target: By 2015, a national biodiversity monitoring and reporting system on biodiversity has been established, using the CHM as a platform for information, knowledge management and networking.	

Strategic Action 17	<ul style="list-style-type: none"> <li>▪ Enhance technical and managerial capacity of officials and staff on biodiversity conservation and management as laid out in the Strategic Action Plan (SAP) and the Capacity Building Plan on Protected Areas under the PoWPA Project of the MAP (cf. also NBSAP Capacity-building Plan Chapter)</li> </ul>
Strategic Action 18	<ul style="list-style-type: none"> <li>▪ Develop an integrated research programme for Timor-Leste and intensify research efforts on the different aspects of forestry, protected areas, agriculture and other ecosystems, such as population studies, ecological studies, water quality assessment, and impact of alien invasive species</li> </ul>
Strategic Action 19	<ul style="list-style-type: none"> <li>▪ Maintain and put into operation the Clearing House Mechanism (CHM) as the platform for knowledge sharing and networking</li> </ul>
Strategic Action 20	<ul style="list-style-type: none"> <li>▪ Document and promote indigenous and traditional knowledge, techniques and practices for biodiversity conservation and environmental protection</li> </ul>
Strategic Action 21	<ul style="list-style-type: none"> <li>▪ Coordinate with donor partners, the United Nations and regional organizations and explore ways to substantially increase levels of funding and develop joint programmes</li> </ul>

# CHAPTER 3

## CHAPTER 3 THE ACTION PLAN



# Plan and Partnership Strategy

## 3.1 National Actions to Achieve the Priority Targets and Strategies

Timor-Leste’s Priority Strategies and Targets will be implemented for a period of 10 years (2011-2020) and will involve working not only among environment agencies, but more particularly with key critical sectors such as agriculture and tourism, and engaging local communities, harnessing traditional knowledge and providing for livelihoods to address conservation and income for poor and disadvantaged communities.



Following are the 21 Strategic Actions identified for the 5 Priority Strategies and Targets. For each Strategic Action, sub-activities were also identified following the NBSAP stakeholders consultation process.

#	Strategic actions and sub-actions	Timelines	
		2012-2015	2016-2020
	<b>PS 1 - Mainstreaming biodiversity into sectoral plans and programmes to address the underlying causes of biodiversity loss</b>		
1	Raise awareness on the values of biodiversity and engage various sectors including the media, business sector, youth and women groups and local communities in conservation activities:		
1.1	Conduct communication, education and public awareness activities through forum, seminars and public dialogues on environment and biodiversity conservation especially on various topics such as sustainable management of ecosystems; endangered species and prohibition of collection and sale; pollution and garbage; wildlife management and conservation; sound management of land, forest and water resources; and other related topics.	■	■
1.2	Produce and distribute CEPA publications such as brochures, pamphlets, newsletters and other printed materials, and participate in exhibits in village and school activities.	■	■

1.3	Establish a Communication and Education and Information Centre and Library.	■	
1.4	Develop modules on environment and biodiversity conservation for integration in the elementary and high school curriculum.	■	■
2	Mainstream sectoral plans, policies, and national planning		
2.1	Develop policies and programmes to integrate biodiversity into agriculture programmes and promote agro-biodiversity.	■	■
2.2	Introduce and promote appropriate and environmentally-compatible improved farming practices to increase production in agricultural lands, e.g. alley cropping, crop rotation, terracing, high-yield seeds.	■	■
3	Promote nature-based and community-based sustainable tourism and ecotourism:		
3.1	Review and develop national and local laws and policies on tourism and ecotourism.	■	
3.2	Establish and develop key tourism destinations and ecotourism centers with upgraded infrastructures and promotional materials that integrate biodiversity.		■
4	Develop and enforce a sustainable land management and land use policy:		
4.1	Socialize and implement sustainable land management and land use policy.	■	
4.2	Monitor impacts of sustainable land management and land use policy.	■	
4.3	Enhance sustainable land management and land use policy.		■
5	Ensure impact assessment of development projects through the Environmental Impact Assessment (EIA) system:		
5.1	Enhance implementation of the EIA system (National Decree No. 5/Feb 2011) for specific development projects	■	■
5.2	Implement appropriate EIA system and evaluate impacts of development projects (industry, oil and mining, infrastructure, energy, transport, etc.)	■	■
	<b>PS 2 - Protecting biodiversity and promoting sustainable use</b>		
6	Enhance and develop a national biodiversity law and relevant environmental policies on nature conservation, pollution and other related concerns, including traditional laws:		
6.1	Conduct inclusive stakeholder consultation/socialization of the national Biodiversity Law/Decree and Wildlife Conservation Law.	■	
6.2	Facilitate enactment and implementation of the National Biodiversity Law, including wildlife conservation policies and benefits sharing.	■	
6.3	Strictly implement environmental decrees, regulations and policies at national and district levels, including traditional laws (Tara Bandu).	■	■
7	Rehabilitate damaged and critical habitats and ecosystems and degraded watersheds through massive tree planting including mangrove reforestation:		
7.1	Establish community-based nurseries especially for high-value timber trees and involve local communities in reforestation/planting activities.	■	■
7.2	Conduct massive tree planting activities by targeting one million trees nationwide every year, and reforest degraded mangrove areas.	■	■

7.3	Assess and identify areas suitable for planting (e.g., degraded mountain slopes and watersheds) and identify appropriate rehabilitation approaches and suitable species for planting (e.g., suitable tree species include trees for domestic and commercial use and for environmental rehabilitation).	■	■
7.4	Develop and implement a monitoring and evaluation system for rehabilitation activities (to monitor growth and survival and replanting needs).	■	■
8	Assess impacts of invasive species and prevent and control their spread:		
8.1	Identify invasive species and pathways in critical sites and assess their impacts on ecosystems and biodiversity.	■	■
8.2	Identify and implement prevention, control or eradication measures on invasive species.	■	■
9	Implement sustainable livelihood activities for local communities, promote traditional conservation knowledge and practices, and enhance the role of women and youth in biodiversity conservation:		
9.1	Organize and mobilize communities to protect and manage forests and other ecosystems.	■	
9.2	Sensitize communities and let them understand the importance and values and functioning of ecosystems and biodiversity resources therein.	■	
9.3	Develop pilot sites to mobilize communities to protect and manage forests.		■
9.4	Enhance existing and develop new sustainable livelihood options for local communities.	■	
	<b>PS 3 - Building climate resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity</b>		
10	Effectively manage representative samples of biodiversity in identified protected areas and create natural conservation zones to protect specific biodiversity and ecosystems:		
10.1	Delineate and map protected areas and identified conservation areas including lands occupied by local people.	■	
10.2	Assess flora and fauna and identify endangered and threatened species, together with the direct and indirect causes of threat.	■	
10.3	Identify and develop protection programmes for endangered species in all ecosystems (forests, mountains, inland wetlands, coastal and marine areas, agricultural lands, etc.), including commercially and culturally valuable species.	■	
10.4	Prepare and implement a management plan for each protected area integrating climate change, connectivity, promotion of equity and benefit-sharing, as well as standards for the preparation and approval, and establish effective management systems for the terrestrial and marine protected area network.	■	
10.5	Establish multi-stakeholder Protected Area Management authorities for each of the 52 identified sites, composed of government, district authorities and local community representatives.		■

10.6	Establish in-situ and ex-situ conservation approaches/pilot sites/facilities to conserve specific endangered plant or animal species.		■
10.7	Establish wildlife rescue and refuge centers.		■
11	Develop and implement a comprehensive and integrated coastal and marine and fisheries management programme and promote responsible and sustainable coastal and marine resources use:		
11.1	Develop a comprehensive and integrated marine and coastal policy and fisheries management system.		■
11.2	Establish and implement Integrated Coastal Management (ICM) programmes focusing on sustainable livelihood development, including sustainable fishery management.		■
11.3	Enhance fishery production quality and improve distribution of fisheries production, including developing fisheries production quality standards.		■
11.4	Support the creation of financial institutions for fishermen and fish farming communities.		■
11.5	Develop fish processing technology and establish fish processing plants.		■
12	Develop and implement a comprehensive and integrated agricultural management programme aimed at maintaining plant genetic diversity:		
12.1	Diversify types of products and develop alternatives to subsistence agriculture through the Seeds of Life Programme.	■	
12.2	Employ techniques such as the Integrated Pest Management (IPM); Integrated Crop Management (ICM); and System of Rice Identification (SRI).	■	
12.3	Establish gene banks to ensure sustainable supply of seeds.		■
12.4	Establish an animal laboratory and medical center.		■
13	Develop and implement a waste management programme on composting, recycling, and re-using of domestic, commercial and other wastes:		
13.1	Conduct public awareness campaign on waste management.	■	
13.2	Mobilize communities to conduct waste management activities.	■	■
13.3	Establish waste management centers for composting, recycling and re-using of domestic, commercial and other wastes.		■
13.4	Establish livelihood options for local communities using waste products.		■
<b>PS 4 - Enhancing biodiversity and ecosystem services to ensure benefits to all</b>			
14	Conduct a valuation and accounting of direct and indirect goods and services of biodiversity resources and ecosystems:		
14.1	Promote public awareness on the economic values of ecosystems and biodiversity and the goods, services and ecological functioning these provide.	■	
14.2	Identify and develop a system of economic instruments such as incentives and penalties.		■
15	Safeguard and maintain ecosystem services through promoting the Integrated Water Resource Management Plan:		

15.1	Develop and implement an Integrated Water Management Plan, involving key concerned sectors (forestry, infrastructure, water management authorities) to address pollution and sedimentation.		■
15.2	Monitor pollution/water quality, sedimentation of rivers, soil erosion and implement restoration activities to prevent siltation.	■	■
15.3	Develop water quality standards and establish a water quality laboratory.		■
15.4	Develop and implement payment for ecosystem services (PES) schemes for water resources.		■
16	Develop and promote understanding of national policies on access and benefit-sharing arising from utilization of genetic resources, including biosafety measures:		
16.1	Conduct awareness-raising among policymakers, government and non-government stakeholders, including private sectors and communities to understand the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS).	■	
16.2	Conduct national and local consultations in developing national policies on ABS.	■	■
	<b>PS 5 - Enhancing implementation of the NBSAP through participatory planning, knowledge management and capacity building, including district and sub-district and community levels</b>		
17	Enhance technical and managerial capacity of officials and staff on biodiversity conservation and management as laid out in the Strategic Action Plan (SAP) and the Capacity Building Plan on Protected Areas under the PoWPA Project of the MAF (cf. also NBSAP Capacity-building Plan Chapter).		
18	Develop an integrated research programme for Timor-Leste and intensify research efforts on the different aspects of forestry, protected areas, agriculture and other ecosystems, such as population studies, ecological studies, water quality assessment, and impact of alien invasive species:		
18.1	Identify and implement research needs and priorities of the different sectors on biodiversity and ecosystems services.	■	■
18.2	Identify and develop capacities for academic centers of excellence on taxonomy, for inventory of species.		■
18.3	Establish botanical gardens, herbariums and zoos to showcase the indigenous flora and fauna of the country and to serve as center for taxonomic and conservation biology research.		■
19	Maintain and put into operation the Clearing House Mechanism (CHM) as the platform for knowledge sharing and networking:		
19.1	Maintain and enhance the CHM server and further develop the information system database.	■	■
19.2	Update information and data on biodiversity through inter-agency collaboration (Timor-Leste CHM Network)	■	■
20	Document and promote indigenous and traditional knowledge, techniques and practices for biodiversity conservation and environmental protection:		
20.1	Document and analyze traditional knowledge as to its relevance to biodiversity conservation (e.g. Tara Bandu).	■	■

20.2	Promote traditional knowledge and practices relevant to biodiversity conservation.	■	■
21	Coordinate with donor partners, the United Nations and regional organizations and explore ways to substantially increase levels of funding and develop joint programmes:		
21.1	Develop joint programmes with relevant sectors for funding by bilateral and multi-lateral partners (e.g., GEF, UNDP, UNEP, FAO and bilateral partners).	■	■
21.2	Establish and/or enhance partnerships and linkages with regional organizations and programmes such as Coral Triangle Initiative (CTI), Partnership for Environmental Management for Seas of East Asia (PEMSEA), Arafura-Timor-Leste-Seas Forum (ATSEA), South Pacific Regional Environment Programme (SPREP), and ASEAN Centre for Biodiversity (ACB).	■	■

**Annex 3 revised** presents the recommended activities for Timor-Leste following the CBD Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets. While there are 5 Priority Actions and 5 Priority targets identified in Chapter 2, and sub-activities were further identified in the 21 Strategic Actions outlined above, Annex 3 revised provides also further activities to be pursued for the period 2011-2020. The activities detailed in Annex 3 will serve as checklist and menu of activities that will guide national efforts to achieve the NBSAP strategic priorities and other areas, which may be covered in addition to the priority actions and targets.

### 3.2 Capacity Development Plan: Building a Cadre of Conservation Practitioners and Experts in Timor-Leste

Conservation of important biodiversity of Timor-Leste requires political commitment, widespread awareness and, more importantly, innovative approaches to reconcile the needs of nature with those of the needs of Timorese people. It requires knowledgeable, skilled and committed workforce. Training, workshops and other capacity building activities are generally seen as the major means of reaching this goal. This is in line with the CBD Strategic Plan for Biodiversity 2011 – 2020 and the Aichi Goal 5: Enhance implementation through participatory planning, knowledge management and capacity building, in particular Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning status and trends, and the consequences of its loss, have been improved, widely shared and transferred and applied.

## Capacity Development Plan for Biodiversity

Goal	By 2020, the people of Timor-Leste are equipped with appropriate knowledge, skills and values needed for the effective management and conservation of the forests, marine and coastal zones, wetlands, freshwater rivers and lakes, agriculture and protected areas.
Overall Objective	To ensure effective management and conservation of biodiversity (at the levels of ecosystems, species and genetic variability).
Specific Objectives	1. To strengthen the capacity of national officials and staff in the management of forests, wetlands, marine and coastal zones, wetlands, freshwater rivers and lakes, agriculture and protected areas.
	2. To enhance capacity of local communities to support conservation and management of the different biodiversity resources and ecosystems.
	3. To mobilize Timor-Leste's stakeholders at national and district levels to support biodiversity policies and laws and participate in actions identified in the NBSAP.
	4. To contribute to fulfillment of commitments to CBD and other international conventions.
Target Stakeholders	<ol style="list-style-type: none"> <li>1. Legislators and high level officials in government (e.g., National Parliament; Ministry of Economy and Development; Ministry of Agriculture and Fisheries; Ministry of Information; and District Officials)</li> <li>2. Managerial and higher technical staff; technical/supervisory staff; skilled workers and laborers in the government</li> <li>3. Public (local communities, farmers and fisher folks, youth and women, illegal wildlife traders, illegal loggers, poachers, etc.)</li> </ol>

Building staff capacity in a sustainable way is a long-term commitment and requires an investment of time, support and evaluation. For Timor-Leste, there is a need to enhance capacity of officials and staff especially on protected areas, to ensure effective management of the various ecosystems in the country. Likewise, there is a continuing need to document and analyze previous efforts on capacity building. As reported, Timor-Leste requires considerable efforts to develop its capacity to conceptualize, formulate, and implement policies, legislations, strategies, and programmes, to build consensus among stakeholders, to monitor, evaluate, report and learn (NCSA Project, 2006).

In building a cadre of conservation practitioners and experts in Timor Leste, the Global Environment Facility (GEF) Guidelines on Capacity Development and the ASEAN Guidelines on Competence Standards for Protected Area Jobs will be used. This will consider the three levels of capacity development:

1. **Individual capacity development** includes interventions that create and improve knowledge, skills and attitudes through trainings and workshops; on-the-job professional development and continuing education; and/or mentoring, study tours and networking. Individual capacity development at national and community level is necessary for successful implementation of on-the-ground interventions for sustainable land and forest management. Strengthened individual capacities also determine an institution's capacity to perform certain functions.
2. **Institutional capacity development** includes interventions that create and improve missions and mandates; culture, structure and competencies; planning and quality management processes; human resources; effective management and allocation of financial resources; information resources and material conditions. Strengthened institutional capacity is also a way to develop individual and systemic capacity. Institutions with strengthened individual capacity will be able to develop good policies, regulations and economic incentives which enable implementation of interventions on the ground.
3. **Systemic capacity development** includes interventions that create and improve enabling environment including policies, regulations and economic incentives to support individual and institutional capacity building.

### 3.2.1 Action Plan for Capacity Development

At the NBSAP consultation workshops held in May and July 2011, the following training areas were identified as priority training, among others:

Training Areas	Conservation Jobs										
	1	2	3	4	5	6	7	8	9	10	11
1. Awareness, education and public relations	●	●	●	●	●	●	●	●	●	●	●
2. Biodiversity project planning, implementing and managing	●	●	●	●	●						●
3. Management effectiveness assessment		●	●	●	●						●
4. Facilitation skills to moderate public consultations		●	●	●	●						●
5. Financial and physical resources management		●	●	●	●						●
6. Human resources management		●	●	●	●						●
7. Natural resources , socio-economic and cultural assessment		●	●	●	●	●			●		●
8. Protected area policy, planning and management			●	●	●	●	●	●	●		●

9. Recreation and tourism			●	●	●	●		●	●	●	●
10. Site management					●						●
11. Field craft (Practical skills for working safely and effectively)					●		●	●	●	●	●
12. Enforcement					●		●	●	●	●	●
13. Ecosystem assessment and management including <ul style="list-style-type: none"> <li>● conservation of ecosystems, habitats and species</li> <li>● Sustainable agriculture practices</li> <li>● Reforestation</li> <li>● Community level rehabilitation activities</li> <li>● Sustainable livelihood including vocational training and technical support for self-employment</li> </ul>	●	●	●		●	●	●	●	●	●	
14. Gender sensitization	●	●	●	●	●	●	●	●	●	●	●
15. Technical aspect of sustainable land management		●	●	●		●			●	●	●
Legend:											
1- Policy/Decision makers and directors 2- Chiefs of divisions 3 – Technical staff 4 – Heads of tourism units 5 – Heads of protection and enforcement unit 6 – Researchers						7 – Enforcement rangers 8 – Tourism officers/guides 9 – Community Officers 10 – Farmers & communities 11 – District/sub- district level					

In order to address the capacity needs for biodiversity conservation in Timor-Leste, and taking into account the identified priority trainings, the following action plans at each level of capacity development are proposed.

## Individual Capacity Development

Action	Specific Activities
1. Training Needs Assessment	Review of the structure and mandates of concerned organizations and entities
	Review of existing job profiles and qualifications for the different jobs
	Interviews with personnel to determine actual jobs and responsibilities and get recommendations
	Compile and analyze pertinent data gathered
	Identify and prioritize training and capacity building activities to be undertaken
2. Development of competence standards for specific jobs	Review of existing job profiles and qualifications for the different jobs including skills, knowledge and attitude
	Interviews with personnel to determine actual jobs and responsibilities and get recommendations
	Compile and analyze all data gathered
	Edit skills into categories and add a level to each skill; add knowledge requirement and define range and context of skills
	Identify competence and levels required for each job and get comments from experts and heads of offices
	Finalize occupational standards for Timor-Leste
3. Conduct of training, workshops, trainer's training and other capacity-building activities	Identify trainings, workshops and other capacity building activities to be undertaken
	Develop activity design and/or training modules
	Conduct of the workshop; approaches may include paper/powerpoint presentations, workshop and plenary discussions; sharing of experiences, best practices and lessons learned; field trips and study tours and action planning/re-entry plans
	Monitoring of contribution of capacity building activity to be done through actual visit to the sit; interview of participants; assessment of staff performance ; and/or checking of action/re-entry plans

4. Provision of degree programmes; on-the-job professional development; mentoring and vocational training for Timorese	Depend on the needs of the organization
5. Establishment of information database and network of experts in the country	List all participants and experts in the country
	Develop a website for training and roster of experts

### Institutional Capacity Development

Action	Specific Activities
1. Identification of responsibilities for all aspects of biodiversity conservation so as to prevent overlaps and conflicts	Review mandates and functions of all agencies most especially those related to biodiversity conservation.
	Reformulate/Formulate corresponding duties and responsibilities of agencies and their staff.
	Strengthen/Establish network of cooperation among government agencies, NGOs, donor agencies and other relevant organizations.
	Determine specific entry points in integrating biodiversity conservation guidelines and plans in the activities of the government agencies
	Prepare procedural and technical guidelines in land use planning especially for biodiversity-rich areas.
2. Formation of and strengthen inter-agency groups and committees	Form a curriculum drafting committee
	Form an inter-agency advocacy group on population biodiversity-environment
3. Establishment of research and other information centers	Establish the following: <ul style="list-style-type: none"> <li>• Biodiversity center</li> <li>• Biodiversity research and information center</li> <li>• Botanical gardens, gene banks and refuge centers</li> <li>• Ecotourism center</li> <li>• Biodiversity training and livelihood center</li> </ul>

## Systemic Capacity Development

Action Plan	Specific Activities
1. Formulation of an integrated policy and legislative framework for the conservation, sustainable use and equitable sharing of benefits of biodiversity.	Review and reformulate existing relevant laws and regulations, including traditional laws related to biodiversity conservation
	Formulate additional new laws and regulations for the effective management of the various ecosystems especially protected and conservation areas.
2. Establishment of coordination mechanisms and strategic planning support to various government organizations and international conventions of which Timor-leste is a Party of	Assess country's capacity to implement international conventions (CBD, UNCCD, UNFCCC) and other relevant MEAs
3. Review, evaluate and monitor the enforcement of laws and implementation of environmental laws and regulation, standards and guidelines.	

This Capacity Development Plan for Biodiversity will be implemented in parallel with the Capacity Building Plan (Cap-B Plan) for the Programme of Work on Protected Areas of Timor-Leste (work in progress as of July 2011, MAF-DNF PoWPA Project). The PoWPA Cap-B Plan will address, among others, the initially identified capacity gaps in protected area management at the individual (local land users lack access to innovations; limited expertise; limited knowledge on new tools), institutional (sectoral divisions, overlapping mandates, inadequate funding) and systemic levels (policy disincentives, legal constraints especially land tenure, and poor land use planning). The draft PoWPA Cap-B Plan will look at capacity building on: (1) project management and technical Services; (2) challenges and needs for effective governance, management systems, and human resources and development needs; (3) stakeholders capacity for effective participation and interaction; and (4) action planning on various management systems for use by the Ministry of Agriculture and Fisheries.

### 3.3 Partnership Strategy

The Partnership Strategy for NBSAP will address the financing needs for priority strategies and targets outlined in Chapter 2. Strategic Action 21, in particular, specifies the coordination with donor partners, UN and regional organizations and exploring ways to substantially increase levels of funding, as well as development of joint programmes. The Partnership Strategy will further ensure the longer term sustainability, including recurring costs,

of biodiversity conservation, the continuous engagement of key stakeholders, and sustained public awareness campaign on the values of biodiversity.

Taking into account the existing partnerships of Timor-Leste with institutions from the global, regional and national levels, the Partnership Strategy further enhances these partnerships, as well as explores new possibilities and potential partners in pursuing the priority strategies and targets of the NBSAP.

STRATEGY and ACTIONS	TARGET PARTNERS
1. Establishment of an inter-agency committee to develop sustainable financing mechanism to generate revenues for biodiversity programmes	Representatives from concerned sectoral directorates (Finance, Planning and Budget Ministries, MAF, MED)  Private Sector
2. Review existing scope of the Petroleum Fund of Timor-Leste to consider biodiversity in its priority support areas	Finance Ministry
3. Develop specific project proposals for the priority strategic areas and joint programmes for various donors and partners	Multilateral organizations/agencies (GEF, UN Agencies) Funding Donors
a. Optimize funding allocation from the Global Environment Facility (GEF) under the System for Transparent Allocation of Resources (STAR, GEF Secretariat, September 2010), where Timor-Leste has been allocated a total of US\$ 4.40 M for the following focal areas: Biodiversity (\$1.50M); Climate Change (\$2.0M); and Land Degradation (0.90M).	GEF UN Agencies
b. Undertake joint and synergistic programming across these 3 GEF focal areas (e.g., joint programme on biodiversity and climate change; joint programme on biodiversity and land degradation).	GEF UN Agencies
c. Develop community-based biodiversity and livelihood projects and activities and tap GEF Small Grants Programme and other small-scale funding windows of other bilateral partners to support on-the-ground community actions	GEF-SGP Bilateral Partners such as Japan on PoWPA related actions; Australia on agrobiodiversity, sustainable agriculture and livelihoods

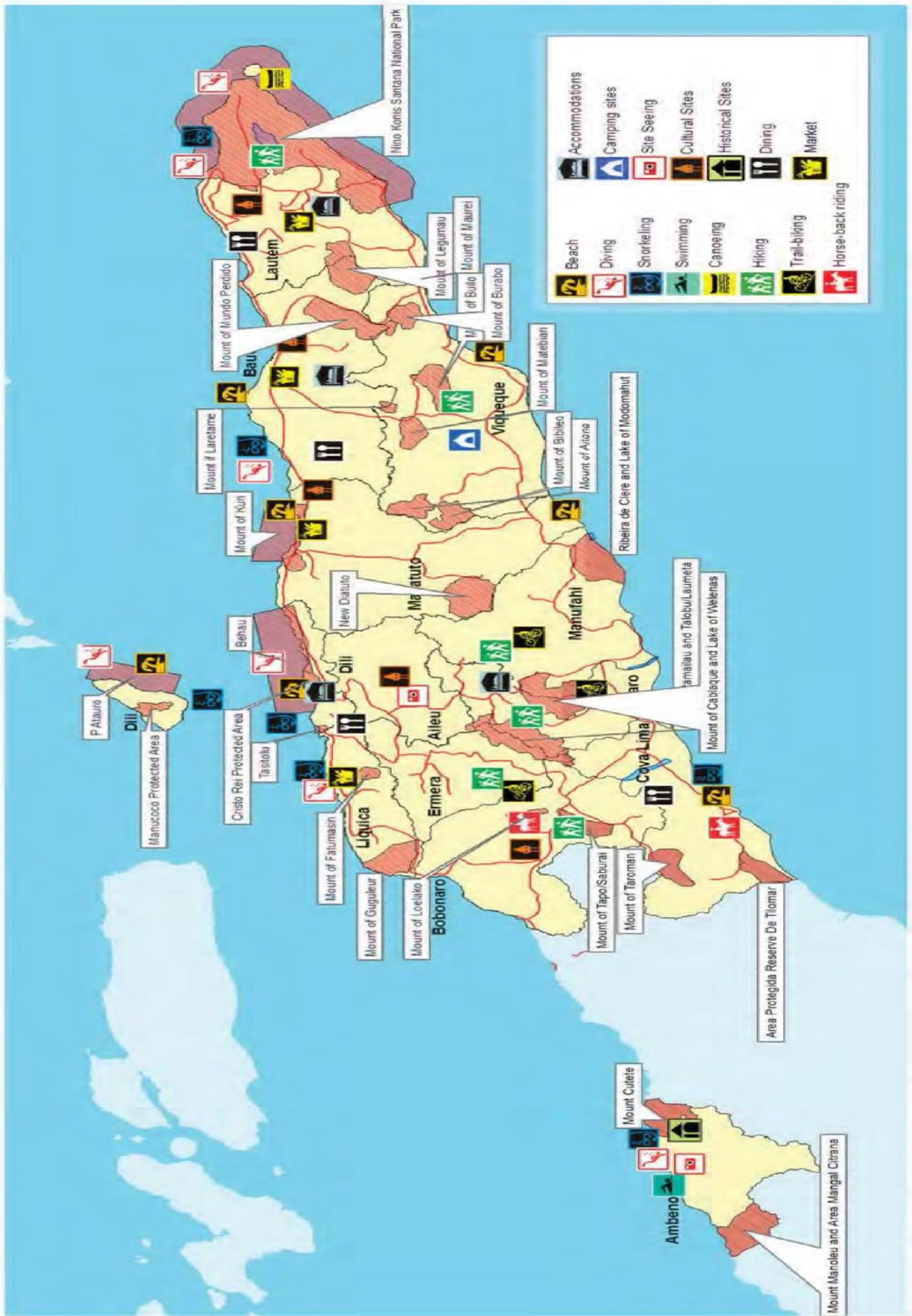
Timor-Leste has been receiving technical support and assistance from multilateral and bilateral partners, particularly from UN agencies such as UNDP, UNEP, and FAO. Timor-Leste also participates in various regional programmes and projects. To this end, Timor-Leste will continue to forge partnership with UN agencies and bilateral partners, both at the national, and regional and global levels.

Timor-Leste will also capitalize on its existing involvement and partnership with various regional programmes through enhancing partnerships and linkages with regional organizations and programmes such as the Coral Triangle Initiative (CTI), Partnership for Environmental Management for Seas of East Asia (PEMSEA), Arafura-Timor-Seas Forum (ATSEA), South Pacific Regional Environment Programme (SPREP), and the ASEAN Centre for Biodiversity (ACB).

### ***Ecotourism in Timor-Leste: Potentials for Partnership***

Strategic Action 3 specifies promoting nature-based and community-based sustainable tourism and ecotourism. Ecotourism in Timor-Leste has great potential for growth because of new and yet to be discovered tourism sites, be it the country's coastal waters, or the vast terrestrial areas. Ecotourism activities that have been identified include recreation in beaches, diving, snorkeling, swimming, and canoeing, and sport fishing in the coastal area; hiking/trekking, mountain climbing, trail-biking, horseback riding, camping (especially for backpackers), site seeing, visiting cultural sites / historical sites in the terrestrial areas. Wildlife observation such as dolphin / whale watching, and bird watching are also recreational activities that are being discovered by tourists.

The identified protected areas in Timor Leste, though irregularly distributed, provide an array of possible recreational activities, because of the attraction to tourists to experience different nature activities. This potential of Timor-Leste for ecotourism opens possibilities for partnership with various institutions not only for sustainable financing, but also in raising awareness for biodiversity conservation, and the creation of livelihood opportunities that would aid in the alleviation of poverty.



Protected Areas in Timor-Leste

CHAPTER 4

CHAPTER 4  
THE  
IMPLEMENTATION  
PLAN



# Coordination Mechanism, Clearing House Mechanism on Biodiversity and CEPA Strategy

## 4.1 NBSAP Coordination and Implementation Mechanism

The Ministry of Economy and Development (MED) through the Secretariat for Environment and the National Directorate for Environmental Services (DNMA) is the lead government agency of Timor-Leste responsible for biodiversity conservation, in close coordination with the Ministry of Agriculture and Fisheries (MAF). As such, the MED led the process in the preparation of the National Biodiversity Strategy and Action Plan (NBSAP) and is responsible for monitoring its implementation. The MED also leads the National Biodiversity Working Group (NBWG), a multisectoral body composed of representatives from various ministries and directorates, primarily from the MAF, Ministry of Industry, Tourism and Trade, other government agencies, including civil society and academe. The MED and the NBWG are responsible for the monitoring and review of the implementation of the Strategy for reporting to the Council of Ministers. The implementation of the Strategy and its progress reporting will form part of the reporting of achievements of Timor-Leste's Strategic Development Plan (SDP) and Timor-Leste's submission to the Convention on Biological Diversity (CBD).

The NBSAP of Timor-Leste will be implemented through specific programmes, projects and activities at the national and district levels. The participation of relevant stakeholders will be promoted and facilitated at all levels of implementation. Initiatives and activities of local communities should be supported and encouraged. The means of implementation may vary depending on the activity. The CBD has developed thematic programmes of work that can provide guidance on the effective development and implementation of national and sub-national targets: forests and mountains; protected areas; inland waters; agriculture; and marine and coastal ecosystems. Other cross-cutting issues could also contribute to the development and reduction of poverty. These should also be considered in the updating of national biodiversity strategies and action plans.

Partnership with various organizations and donors will ensure effective implementation of the NBSAP of Timor-Leste to contribute to sustainable development and reduction of poverty. Further, it will garner the ownership necessary to mainstream biodiversity across sectors of the government and society; promote biodiversity-friendly practices by business; and promote synergy and coherence in the implementation of multilateral environmental agreements. Partners may include, among others, other conventions and multilateral/bilateral agencies, foundations, women, local communities, non-governmental organizations, civil society and the public sector.

## Monitoring Scheme

At the global level, Timor-Leste as a Party to the CBD will be subject to regular review by the Conference of the Parties (COP) through the CBD Secretariat. Progress on the implementation of the NBSAP will be subject to reporting requirements on the progress achieved, depending on the decision by the COP. The next submission of national reports to the CBD will be on 14 March 2014 for the Fifth National Report to the CBD. In cooperation with other Convention bodies, COP will keep under review the implementation of NBSAP by all Parties and will support effective implementation at the national level. The COP will review the progress set out in the NBSAP and make recommendations to overcome any obstacle encountered. To facilitate this work, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) develops a common set of biodiversity indicators to be used to assess the status of biodiversity and its values.

The NBSAP of Timor-Leste will be monitored for the 5 Priority Targets identified and will also use the targets identified in National Ecological Gap Assessment Report (NEGA, 2011) and the targets in the Strategic Plan and NBSAP as initial basis for monitoring the progress of NBSAP in the early stage.

## Biodiversity Targets in Timor-Leste based on the NEGA Report

Terrestrial Ecosystems Targets
<ul style="list-style-type: none"><li>• Ensure a minimum of 30 percent of the original extent for each major vegetation type to be placed in protected areas</li><li>• Maintain / restore 100 percent habitat connectivity within and around terrestrial protected areas</li><li>• Capture 100 percent of the critical habitats for terrestrial threatened species to be captured in a protected area</li><li>• A minimum of 30% of the distribution of each known taxa to be within a protected area</li><li>• 100% of the known range of terrestrial endemic species to be captured in protected areas</li><li>• 100% of the known range of terrestrial migratory species to be captured in a protected area</li><li>• 50% of the known range of marine migratory species to be captured in protected areas</li><li>• 30% of the nation's sequestered carbon found in living terrestrial vegetation is captured inside protected areas.</li><li>• Ensure that protected areas are as large as they can possibly be</li><li>• Ensure that PA's are connected to one another especially along elevation gradients for terrestrial PA's</li><li>• Ensure climate refugia are protected especially in areas representative of major geological features in the PA system</li></ul>
Marine, Aquatic and Coastal Ecosystems Targets
<ul style="list-style-type: none"><li>• Maintain / restore 50% habitat connectivity within and around marine protected areas</li><li>• A minimum of 50% of the current extent of estuaries to be protected</li><li>• 30% of the distribution of rivers and lakes are in PA's.</li></ul>

- 50% of critical habitats for marine threatened species to be captured in a protected area
- 100% fish spawning areas protected
- 80% of mangrove areas protected
- 30% of each coral reef type in MPAs
- 30% for seagrass habitats in MPA's
- 50% of the known range of marine endemic species to be captured in MPAs
- 80% of the current distribution of mangroves to be protected in PAs based on securing the Carbon of these mangroves

However, the development of national indicators and targets will have to be drawn-up based on the CBD global list of indicators, and reviewing and updating the above national targets given the global targets set-out at COP10 under the Aichi Target. The following will serve as a guide to assess progress towards 2020 targets and to effectively communicate trends in biodiversity related to the three objectives of the CBD.

### CBD Indicators

Focal Area	Headline Indicators	Indicators
Status and trends of the components of biological diversity	<ul style="list-style-type: none"> <li>• Trends in extent of selected biomes, ecosystems and habitats</li> </ul>	<ul style="list-style-type: none"> <li>• Extent of forests and forest types</li> <li>• Extent of various habitats</li> </ul>
	<ul style="list-style-type: none"> <li>• Trends in abundance and distribution of selected species</li> </ul>	<ul style="list-style-type: none"> <li>• Living planet index</li> <li>• Global wild bird index</li> <li>• Water bird indicator</li> </ul>
	<ul style="list-style-type: none"> <li>• Coverage of protected areas</li> </ul>	<ul style="list-style-type: none"> <li>• Area coverage of PA</li> <li>• Overlays with biodiversity</li> <li>• Management effectiveness</li> </ul>
	<ul style="list-style-type: none"> <li>• Change in status of threatened species</li> </ul>	<ul style="list-style-type: none"> <li>• Red List Index</li> </ul>
	<ul style="list-style-type: none"> <li>• Trends in genetic diversity of domesticated animals, cultivated plants and fish species of major socio-economic importance</li> </ul>	<ul style="list-style-type: none"> <li>• Ex-situ selections</li> <li>• Genetic diversity of terrestrial domesticated animals</li> </ul>
	<ul style="list-style-type: none"> <li>• Related studies conducted</li> </ul>	<ul style="list-style-type: none"> <li>• Number of researches conducted</li> <li>• Technologies adopted and shared</li> </ul>
Focal Area	Headline Indicators	Indicators
Sustainable use	<ul style="list-style-type: none"> <li>• Area by ecosystem under sustainable management</li> </ul>	<ul style="list-style-type: none"> <li>• Area of forest under sustainable management; degradation and deforestation</li> <li>• Area of agricultural</li> </ul>

		ecosystem under sustainable development
	<ul style="list-style-type: none"> <li>• Proportion of products derived from sustainable sources</li> </ul>	<ul style="list-style-type: none"> <li>• Proportion of fish stocks in safe biological limits</li> <li>• Status of species in trade</li> <li>• Wild commodities index</li> </ul>
	<ul style="list-style-type: none"> <li>• Ecological footprint and related concepts</li> </ul>	<ul style="list-style-type: none"> <li>• Ecological footprint and related concepts</li> </ul>
	<ul style="list-style-type: none"> <li>• Related studies conducted</li> </ul>	<ul style="list-style-type: none"> <li>• Number of researches conducted</li> <li>• Technologies adopted and shared</li> </ul>
Threats to biodiversity	<ul style="list-style-type: none"> <li>• Nitrogen deposition</li> <li>• Trends in invasive alien species</li> <li>• Number of illegal activities apprehended</li> <li>• Related studies conducted</li> </ul>	<ul style="list-style-type: none"> <li>• Nitrogen deposition</li> <li>• Trends in invasive species</li> <li>• Species in wildlife trade</li> <li>• Apprehended cases</li> <li>• Number of researches conducted</li> <li>• Technologies adopted and shared</li> </ul>
Ecosystem integrity and ecosystem goods and services	<ul style="list-style-type: none"> <li>• Marine trophic index</li> <li>• Water quality of freshwater ecosystems</li> <li>• Trophic integrity of other ecosystems</li> <li>• Connectivity/ fragmentation of ecosystems</li> <li>• Incidence of human-induced ecosystem failure</li> <li>• Health and well-being of communities who depend directly on local ecosystems goods and services</li> <li>• Biodiversity for food and medicine</li> </ul>	<ul style="list-style-type: none"> <li>• Marine trophic index</li> <li>• Water quality index for biodiversity</li> <li>• Forest fragmentation and flow regulation</li> <li>• Health and well-being of communities directly dependent on ecosystem goods and services</li> <li>• Nutritional status of biodiversity</li> <li>• Biodiversity for food and medicine</li> <li>• Related studies conducted</li> <li>• Technologies adopted and shared</li> <li>• Species identified for food and medicine</li> <li>• Studies conducted</li> </ul>
Status of traditional knowledge, innovations and	<ul style="list-style-type: none"> <li>• Status and trends of linguistic diversity and number of speakers of indigenous languages</li> </ul>	<ul style="list-style-type: none"> <li>• Status and trends of linguistic diversity and number of speakers of indigenous languages</li> <li>• Indigenous and traditional</li> </ul>

practices		laws in line with the programs of the government
	<ul style="list-style-type: none"> <li>• Status of traditional knowledge, innovations and practices</li> </ul>	<ul style="list-style-type: none"> <li>• Indigenous and traditional knowledge used by Timorese</li> </ul>
Status of access and benefit sharing (ABS)	<ul style="list-style-type: none"> <li>• Indicator of access and benefit sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/agreements on ABS drafted and enforced</li> <li>• Identified traditional knowledge and its application</li> <li>• Communities benefitted</li> </ul>
Status of resource transfers	<ul style="list-style-type: none"> <li>• Indicator of technology transfer</li> <li>• Official development assistance provided in support of the</li> <li>• Convention</li> </ul>	<ul style="list-style-type: none"> <li>• Official development assistance provided in support of the</li> <li>• Convention</li> </ul>

## 4.2 Clearing House Mechanism of Timor-Leste: A Platform for Learning and Sharing Knowledge on Biodiversity

Under Priority Strategy 5: Enhancing implementation of NBSAP through participatory planning, knowledge management and capacity building, including district and sub-district and community levels, Strategic Action 19 clearly specifies maintaining and operationalizing the Clearing House Mechanism (CHM). The CHM will be a key tool in carrying out the implementation of the priority strategies, targets and actions of the NBSAP of Timor-Leste.

### Establishment and Maintenance of Timor Leste's Clearing House Mechanism (CHM)

The Tenth Conference of the Parties (COP10) Decision X/15 (UNEP/CBD/COP/10/15) emphasizes the importance of national Clearing House Mechanisms (CHMs) as means, not only to promote scientific and technical cooperation among parties to the Convention, but most importantly, to provide information services to facilitate the implementation of the NBSAPs.

Working along this framework, the establishment of a national CHM for Timor-Leste aims to:

- a) Facilitate technical and scientific cooperation and coordination on biodiversity conservation activities among concerned units including local government and non-government organizations, academic and research institutions;
- b) Promote exchange, integration and use of biodiversity information as a tool for informed decision making through the national CHM website;
- c) Promote the use of the national CHM website as a tool to monitor the progress of Timor-Leste's NBSAP; and
- d) Increase awareness of the communities and the general public on Timor-Leste's biodiversity conservation measures through the national CHM website.

### Steps in Establishing a National CHM

Member countries to the CBD are encouraged to take several steps to facilitate the establishment of their national CHMs, the major elements of which are enumerated in Figure 1. Such steps involve, among others, the following:

- a) Identify an appropriate person as the CHM manager, preferably with an Information Technology (IT) background;
- b) Convene a stakeholders consultation and formally organize a stakeholders network including official contact persons and their related contacts information (email, telephone, website);
- c) Agree on minimum biodiversity information uploading in the national CHM website;
- d) Identify roles and responsibilities of each member of the stakeholders network on biodiversity information contributions and frequency of information updating;
- e) Decide on the web programs and equipment to be used in the establishment of a national CHM website;
- f) Conduct capacity enhancement on website establishment, uploading and maintenance;



**Figure 1. Major elements recommended for the successful implementation of a national CHM**

- g) Design and establish a national CHM website as a tool to promote the progress of the NBSAP and mechanism for biodiversity information exchange among concerned agencies; and
- h) Prepare a CHM Business Plan which defines the roles and responsibilities of the CHM components, particularly in information exchange and contribution arrangements, detailed activities pertaining to networking and collaboration among the stakeholders and website establishment and maintenance and budget and funding sources for these activities.



### **Workshop on CHM**

#### **Activities Undertaken Towards Establishing a National CHM in Timor-Leste**

An orientation workshop on species and protected area databases and a CHM stakeholders' meeting were conducted in May 2011. These events were designed to build stakeholders' capacity for developing and maintaining a CHM for Timor-Leste. Participants were oriented on the structure and purpose of the species and protected areas databases and the CHM website. They experienced hands-on exercises on data encoding in both databases and information uploading in the proposed Timor-Leste CHM website. The two events a) provided participants the skill to store biodiversity information in order to make these available for biodiversity-related decision making; b) designated focal points from relevant organizations and identified additional members to form the CHM stakeholders network for Timor-Leste; c) commented on the design and content and validated the proposed national CHM website; and e) commented on the proposed CHM website content and agreed on an expanded CHM website structure.

## The National CHM Design and Structure of Timor Leste

The proposed CHM design and structure for Timor-Leste contains the following sections, among others: Biodiversity in Timor-Leste; Important Bird Areas; CBD National Implementation; News Center; Important Links; and Photo Gallery.

Timor-Leste Clearing House Mechanism for Biodiversity

Main Menu

- Home
- About Timor-Leste CHM
- Biodiversity in Timor-Leste
- Conservation Areas
- CBD National Implementation
- News Center
- Publications
- Photo Gallery
- Important Links
- Timor-Leste CHM Site Map

ABOUT TIMOR-LESTE CHM

The Timor-Leste Clearing-House Mechanism (CHM) is established to facilitate exchange and sharing of biodiversity data and information for the conservation and sustainable use of Timor-Leste's rich and diverse biological resources. As a member of the Convention on Biological Diversity (CBD) by accession, Timor-Leste is committed towards maintaining this national CHM as part of its contribution to CBD's implementation by promoting and facilitating technical and scientific cooperation among stakeholders in the country. Information exchange and sharing is done through the maintenance and management of this national CHM website which can be accessed at <http://chm.tl/>.

Timor-Leste Holds its First CHM Stakeholders' Meeting

Sixteen stakeholders of Timor-Leste's Clearing House Mechanism (CHM) for Biodiversity met on May 17, 2011 at the Center for Journalista Investigador to discuss the mechanisms of establishing and maintaining Timor-Leste's CHM.

Featured Species

Cacatua sulphurea (Yellow-crested cockatoo)

Cacatua sulphurea

[Read more...](#)

What's Happening

- Thu Jul 21 @ 9:00AM - 04:30PM  
[Meeting of the National Biodiversity Working Group](#)
- Thu Jul 21 @ 5:30PM - 08:30PM  
[Biodiversity Policy Dialogue with the Minister of Economy and Development](#)
- Fri Jul 22 @ 8:30AM - 01:30PM  
[Mapping Orientation Training](#)

[View Full Calendar](#)

Featured PAs

Nino Konis Santana National Park

[Read more...](#)

Featured Maps

Important Bird Areas (IBAs)

[Read more...](#)

Species and PA Encoder

[Taxonomic Tree](#)

FEATURED PUBLICATIONS

[read more...](#)

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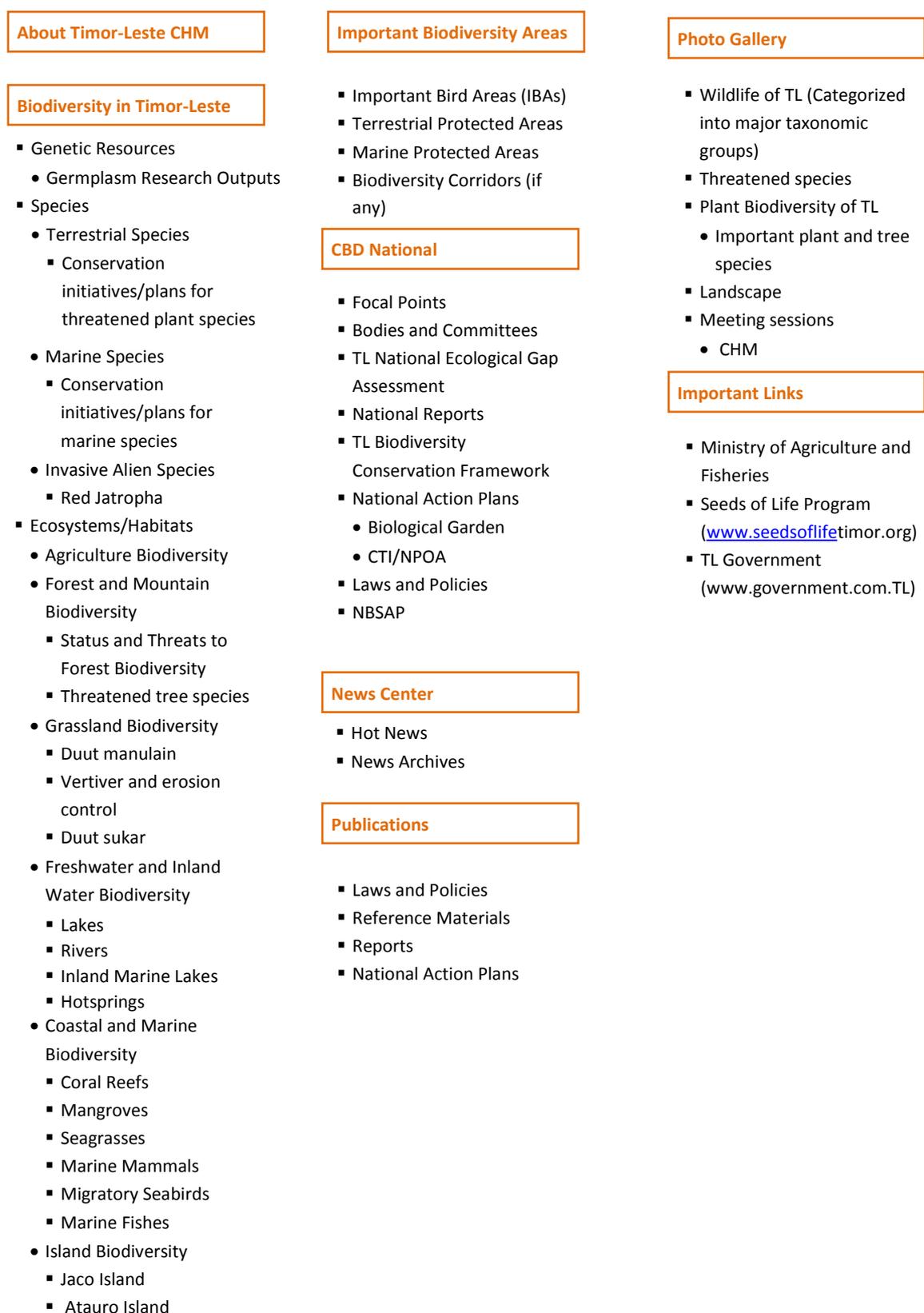
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Figure 2. Proposed National CHM Website Design for Timor-Leste



**Figure 3. Expanded Structure of the National CHM Website for Timor-Leste**

A CHM Business Plan for Timor-Leste will be prepared by the CHM Focal Point with support from the CBD Focal Point together with the CHM Stakeholders Network to facilitate a smooth establishment, operation and maintenance of a national CHM for Timor-Leste. The plan should have the following contents:

- Institutional Arrangements to include time allocation of each agency representative, budget and a stakeholders' directory with contact details (e.g., telephone, email address and website address).
- Responsibilities and Terms of Reference of the CHM focal point, CHM Manager and a Steering Committee which shall oversee the progress of CHM implementation in Timor-Leste. The TORs must be supported with official mandate and specific deliverables. The Steering Committee may comprise the heads of sectoral agencies (MAF, Directorate for Environment, Quarantine, as well as NGOs (Seeds of Life, etc.), academe (University of Dili, etc.).
- Partnership Arrangements which include identification of potential data contributors, contact person of identified data contributors, arrangements for sharing information, defining deliverables in terms of type of information to be contributed, (by sector or subject such as forestry, agriculture, mangrove, fisheries, etc.), frequency of submission (quarterly, yearly, etc.), data format (table or text), means of submission (email, USB, etc.).
- Motivation for data contributors which may include honoraria, web exposure, among others.

### 4.3 Communication, Education and Public Awareness (CEPA) Strategy

In 2007, the Democratic Republic of Timor-Leste became a Party to the CBD, under which it must craft a NBSAP that details how the country will conserve and sustainably manage its biodiversity resources in line with the global biodiversity targets. The NBSAP serves as a key requirement for Timor-Leste's fulfillment of its obligations under the CBD. One of the key elements for a successful NBSAP implementation is a Communication, Education and Public Awareness (CEPA) Strategy and Action Plan. This is also a requirement for all Parties to the CBD.

Currently, Timor-Leste's DNMA takes the lead in raising public awareness on biodiversity protection and conservation at national and village levels through seminars and workshops for relevant department, local authorities, academic institutions, schools and non-governmental organizations (NGOs). The DNMA has started efforts to mainstream biodiversity in the educational system and create public awareness on biodiversity issues and local species through brochures and pamphlets. On the ground, the DNMA uses tree planting activities as a way to include communities on how to protect and conserve biodiversity (*in-situ* and *ex-situ*).

The private sector is also involved in public awareness and participation through the NGOs. A number of tree planting activities involving local communities have been conducted. Most NGOs, however, focus mainly on food security instead of biodiversity conservation issues.

As biodiversity is a crosscutting concern, there is a need for a unified and coordinated approach by government and all sectors of society in promoting the values of biodiversity and mobilizing the general public to get involved in biodiversity conservation, protection and sustainable use and management efforts.

### 4.3.1 The CEPA Strategy and Action Plan for Timor-Leste

This CEPA Strategy and Action Plan identify target audiences, key messages, appropriate communication tools and media, and CEPA activities that may be implemented in Timor-Leste during a ten-year period. The activities identified in the strategy and action plan are based on focus group discussions held between the periods of March and May 2011 and a CEPA Workshop on 23 May 2011 attended by various stakeholders (government and representatives of media, education, business and conservation organizations) as part of Timor Leste’s NBSAP development process.

Goal	By 2020, the people and leaders of Timor-Leste are aware of the values of biodiversity and have taken steps to conserve and use their biodiversity resources sustainably.
Objectives	The overall objective of the CEPA Strategy and Action Plan is to contribute to the successful implementation of Timor-Leste’s NBSAP.
Specific Objectives	1. Contribute to the successful implementation of Timor-Leste’s NBSAP by conducting an advocacy campaign to convince Timor-Leste’s leaders to prioritize biodiversity conservation, protection and sustainable management by mainstreaming them into the national development plan and providing appropriate financial and human resources.
	2. Conduct a “Wise Use Campaign” in Timor-Leste to increase public awareness and understanding of the values of biodiversity and the need for conservation, protection and sustainable use/management through the dissemination of information on the values of biodiversity (species and ecosystems) and its relevance to human survival; sustainable technologies and strategies for effective natural resources management; and other biodiversity-related concerns such as climate change, disaster management, proper waste management, etc.
	3. Mobilize Timor-Leste’s stakeholders at national and district levels to support biodiversity policies and laws and participate in actions identified in the NBSAP.
Target Audiences	1. Legislators and high level officials in government (e.g., National Parliament; MED; MAF; Ministry of Education and Culture; Ministry of Information; Districts) 2. Public (including indigenous peoples, farmers and fisherfolks, youth and women, Illegal wildlife traders, illegal loggers, poachers, etc.) 3. Media 4. Civil society and communities (e.g., Timor-Leste Chamber of commerce and Industry, NGOs, civic and conservation groups, academe and scientific community, youth and women’s organizations, church and religious groups, indigenous people’s/community organizations, local leaders.)

## Key Messages

Key messages will be relayed to the target audiences (see text Box). These key messages will be delivered to the target audiences together with the following:

1. Values of biodiversity to economy and daily life, including values of species and protected areas and how to conserve and protect them for human development and survival.
2. Sustainable technologies and strategies for effective natural resources management, including information on livelihoods that can serve as alternatives to firewood gathering and other environmentally unsustainable sources of income.
3. Information on major biodiversity concerns of Timor-Leste as identified in the NBSAP: habitat degradation and fragmentation, overexploitation, pollution and solid waste management, climate change and related issues, disaster prevention and management

The following key messages will be relayed to the target audiences.

1. *Biodiversity is not the sole responsibility of government, scientific community and conservation organizations as the entire human race relies on biodiversity for survival. Thus, biodiversity conservation and sustainable management is everyone's concern and responsibility.*
2. *Biodiversity when overharvested, not conserved and protected can lead to human extinction.*
3. *Biodiversity conservation and sustainable management needs a committed, strong and unified effort and sustained funding support from all levels of government, society and donor community.*

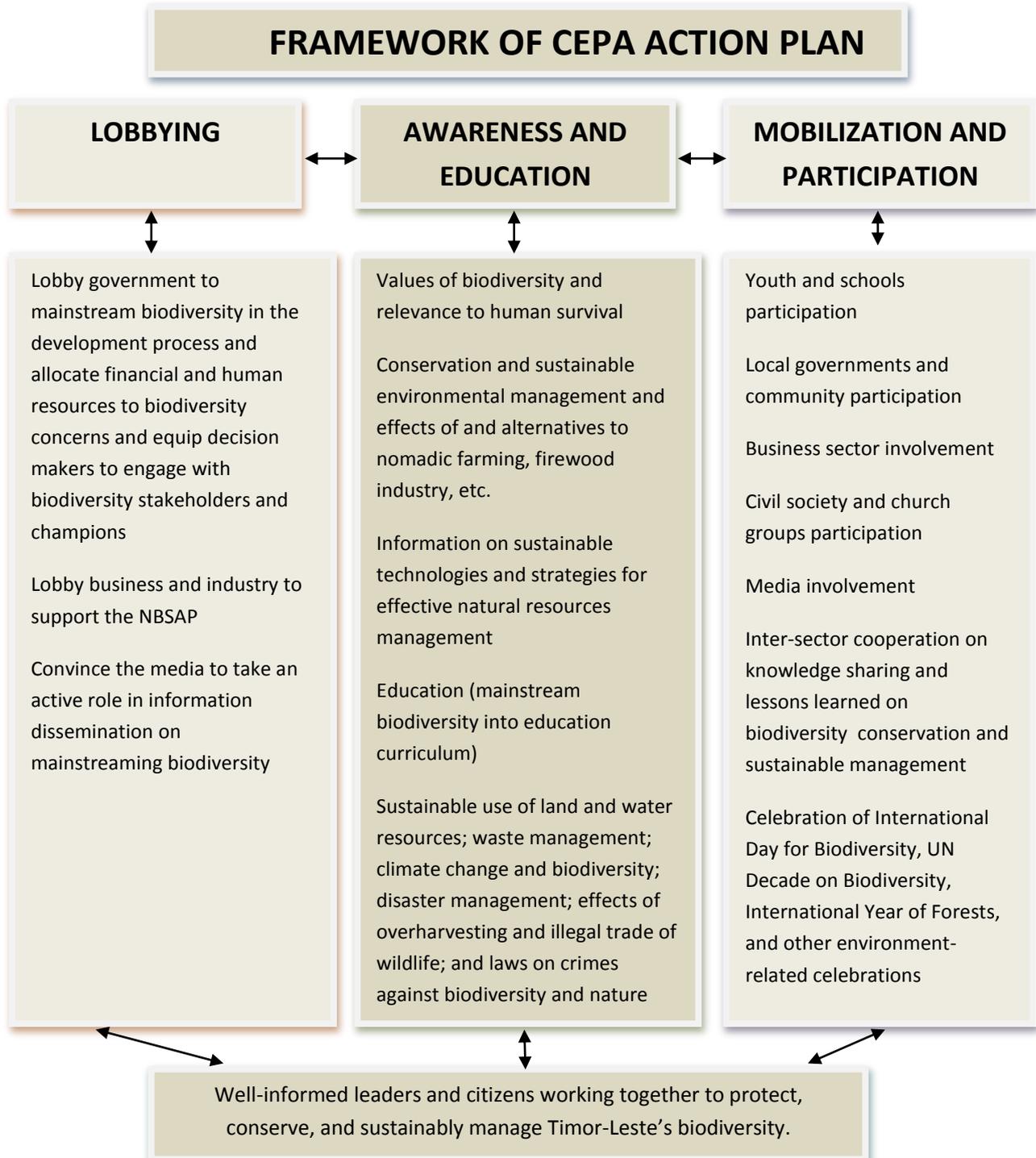
## Media, Communication Products and Public Awareness

This CEPA Strategy will use a combination of media, communication materials and public awareness activities that will be tailor-fitted to appropriate messages and to the profiles and needs of target audiences.

<i>Media</i>	Newspaper, Radio, television, social media and Internet, special media such as community stage plays, visit-and-learn, etc., other media
<i>Communication Materials</i>	Posters, flyers, brochures, comics, etc.; materials for radio and television; billboards, exhibits, video presentations, other communication materials
<i>Public Awareness Venues</i>	Conferences, meetings and dialogues; trainings, seminars and workshops; contests and awards; public events and celebrations; tree planting activities; clean-up activities; other public awareness activities

### 4.3.2 CEPA Action Plan – Framework

The framework below summarizes the Timor-Leste CEPA Action Plan covering three major components: lobbying, awareness and education, and mobilization and participation. The first year of implementation will be focused on producing communication materials that will support activities under the three components.



### 4.3.3 CEPA Action Plan – Specific Activities

#### ***Production of Communication Materials***

The first year of implementation of the CEPA Action Plan will be focused on the production and nationwide dissemination of information materials. As the government has limited resources, businesses operating in Timor-Leste may be encouraged to sponsor the production of such materials. Their company logos may appear in the information materials. This is a win-win arrangement as the government can produce materials with lesser expenses while the private businesses can promote their public image while helping the government in its CEPA campaign. All these materials will be distributed also during leadership and public awareness, mobilization and participation that are enumerated in this CEPA Action Plan.

Communication Materials	Target Audience	Information Contents/Message
<ul style="list-style-type: none"> <li>Brochures/pri mers</li> </ul>	<p>Legislators and high level officials - National Parliament; Ministry of Economy and Development; Ministry of Agriculture, Forestry and Fisheries; Ministry of Education and Culture; Ministry of Information; Local Districts/Governments</p> <p>Private businesses including members of Timor-Leste Chamber of Commerce and Industry</p> <p>General public and schools</p>	<p>Values of biodiversity and the need to mainstream biodiversity in development planning and allocate financial and human resources to biodiversity concerns. Biodiversity conservation and sustainable management needs a committed, strong and unified effort and sustained funding support from all levels of government, society and donor community.</p> <p>Businesses depend on biodiversity for their raw materials and should therefore get involved in protecting and conserving biodiversity to ensure sustained supplies. Businesses should support the NBSAP through their Corporate Social Responsibility (CSR) activities or through direct support to biodiversity projects if they want to assure business productivity.</p> <p>Timor-Leste environmental laws</p>
<ul style="list-style-type: none"> <li>Billboards</li> </ul>	<p>General public nationwide (to be installed in strategic places all over Timor-Leste)</p>	<p>Show beautiful photos of Timor-Leste’s biodiversity and call for public action and participation to conserve biodiversity.</p> <p>Photos and information on Timor-Leste’s wildlife species with an appeal for poachers and illegal wildlife traders to stop their practices; and a call for public action to report crimes against nature.</p>

		Photos of protected areas with information on their benefits to Timor-Leste; and call for public action to help the government in protecting such areas.
<ul style="list-style-type: none"> <li>• Radio and television materials</li> </ul>	General public	Information on the values of biodiversity and how they contribute to human development and survival. Suggestions on how communities, schools, and individual protect, conserve and sustainably use biodiversity. “Socialization” of laws on crimes against nature and other biodiversity and environmental laws.
<ul style="list-style-type: none"> <li>• Posters and bookmarks</li> </ul>	Schools	<p>Photos of Timor-Leste’s important species, endangered species, and protected areas with a call for youth action to conserve biodiversity.</p> <p>Information on how schools and youths can participate in biodiversity conservation.</p>
<ul style="list-style-type: none"> <li>• Comics</li> </ul>	For communities near and around protected areas	Values of species and protected areas with call for action for communities to participate in conservation; information on alternative livelihood to replace firewood gathering and use and other unsustainable practices.
<ul style="list-style-type: none"> <li>• Exhibits</li> </ul>	For school and public market	<p>Important species and protected areas with call for action for public participation in conserving and protecting them.</p> <p>Celebrations such as International Day for Biodiversity, Decade on Biodiversity, International Year of Forests, and other environment-related celebrations.</p>
<ul style="list-style-type: none"> <li>• Video documentary</li> </ul>	General public	Values of biodiversity, crimes and laws against nature
<ul style="list-style-type: none"> <li>• News and features for newspapers</li> </ul>	General public	About Timor-Leste’s NBSAP, CHM, commitments to the CBD and other multilateral environmental agreements, “socialization” of environmental laws, reports on crimes against nature, etc.
<ul style="list-style-type: none"> <li>• Internet, CHM, Facebook and other social networking tools, e-mails</li> </ul>	General public with special focus on schools and youth	Interactive information and activities that will promote fun in biodiversity protection and conservation.

## ***Lobbying***

A variety of activities that will lobby government, the business sector and media to contribute to the mainstreaming of biodiversity in government and society will be implemented.

### ***Lobbying government***

- Conduct a series of briefings for Timor-Leste's Members of Parliament, Ministers, and Local Government/District Leaders on the values of biodiversity and the importance of mainstreaming biodiversity in government to ensure human development and survival. The briefings will work to convince policy-makers and decision-makers to allocate sufficient resources for the protection, conservation and sustainable use of biodiversity.
- Organize field visits of high-ranking government officials to Timor-Leste's protected areas and environmentally-degraded areas to help them realize the need to mainstream biodiversity in the country's development process.
- Write news and features about government officials who are championing biodiversity to inspire them more to work for mainstreaming of biodiversity.
- Conduct a training course for high-ranking government officials to equip them with knowledge to help them in championing biodiversity, in dealing with conservation organizations and biodiversity champions from international and non-government sectors, and in participating in activities of the Convention on Biological Diversity and other multilateral environmental agreements.
- Lobby the President and the National Parliament to declare 2011-2020 as Timor-Leste's National Decade on Biodiversity in line with the UN Decade on Biodiversity; and create a national committee that will lead the celebration of the Decade and other environment-related celebrations.
- Lobby government to declare more protected areas and support the management of such areas.
- Involve government policy-makers and decision-makers in public celebrations such as the International Day for Biodiversity, UN Decade on Biodiversity, International Year of Forests and other environment-related celebrations.
- Lobby the national government to conduct the following nationwide campaigns, reaching out to communities and schools:
  - a. Sea turtle conservation campaign directed at communities that hunt, harvest and consume sea turtles. The campaign should include education, alternative sources of income and coordination with local elders so that the conservation agenda is included in the traditional Tara Bandu.
  - b. Improved implementation of zoning laws through both non-regulatory (CEPA) and regulatory means (enforcement and sanctions).
  - c. Conservation campaign to promote the conservation of wildlife habitats.
  - d. Information campaigns on land use planning - targeting those involved or will be involved in infrastructure development in affinity to inland aquatic ecosystems.
  - e. Public awareness campaign on the negative effects of burning of vegetation and clearing of land for agricultural expansion (nomadic farming).
  - f. Public awareness campaign on the impacts of Illegal hunting, illegal wildlife trade, and hunting for bush meat on the biodiversity resources of Timor- Leste.

### ***Lobbying the business sector***

- Conduct a series of briefings for members and non-members of Timor-Leste's Chamber of Commerce and Industry on the values of biodiversity and the importance of

mainstreaming biodiversity in business to ensure business profitability and sustainability. The briefings will work to convince the business sector to use environmentally-friendly business practices and support government and public efforts in protecting, conserving and sustainably using biodiversity.

- Organize field visits of business people to Timor-Leste's protected areas and environmentally-degraded areas and encourage them to "adopt" protected areas, parks and species for their conservation projects under their Corporate Social Responsibility (CSR) initiatives.
- In partnership with the Chamber of Commerce and Industry and donors, conduct training courses for companies in the area of protection, conservation and sustainable management.
- Involve business leaders in public celebrations such as the International Day for Biodiversity, UN Decade on Biodiversity, International Year of Forests and other environment-related celebrations.

#### *Lobbying the media*

- Conduct a series of briefings for media on the values of biodiversity and the importance of mainstreaming biodiversity in society. The briefings will work to convince the media to support the implementation of the NBSAP and be pro-active in dissemination news and information on biodiversity.
- Organize field visits of media to Timor-Leste's protected areas and environmentally-degraded areas and encourage them to be active in information dissemination, in mobilizing their audiences to participate in conservation activities, and in convincing the public to practice environment-friendly lifestyles.
- Involve media in public celebrations such as the International Day for Biodiversity, UN Decade on Biodiversity, International Year of Forests and other environment-related celebrations.
- Provide media with regular supply of news and information about biodiversity and conservation efforts of government, private sector, schools and other stakeholders.

#### ***Awareness and Education***

A variety of activities that will educate both government and the entire citizenry of Timor-Leste to mainstream biodiversity into society will be implemented.

#### *"Socialization" of Environmental Laws*

- Distribute brochures/primers explaining Timor-Leste's environmental laws and how citizens can participate in their implementation, and encouraging the public to report environmental crimes to proper authorities.
- Broadcast radio and television materials explaining Timor-Leste's environmental laws.

#### *Education*

- With the Ministry of Education taking the lead, develop a national biodiversity education strategy with inputs from national ministries involved in biodiversity conservation and environmental management which will lead the development of modules on environment and biodiversity conservation (coastal ecosystems and their management, focusing on habitat building species such as mangroves, coral reefs and seagrasses) to be integrated in the school curriculum.

- Produce educational and audiovisual materials on Timor-Leste's important and endangered species, values of ecosystems, protection and sustainable management of biodiversity, pollution prevention and proper waste management, for showing in elementary and high schools to promote student appreciation of Timor-Leste's rich biodiversity and ecosystems.
- Distribute brochures/primers explaining Timor-Leste's environmental laws and how students can participate in their implementation, and encouraging the youth to report environmental crimes to proper authorities.
- Promote the use of Timor-Leste's CHM among schools and target users.

### ***Public Mobilization and Participation***

A variety of activities that will mobilize public participation will be implemented in cooperation with government and partners.

#### *Communities and schools*

- Implement national campaigns in community and school levels as identified under the LOBBYING GOVERNMENT section of this CEPA Strategy and Action Plan
  - a. Sea turtle conservation campaign directed at communities that hunt, harvest and consume sea turtles. The campaign should include education, alternative sources of income and coordination with local elders so that the conservation agenda is included in the traditional Tara Bandu.
  - b. Conservation campaign to promote the conservation of wildlife habitats.
  - c. Information campaigns on land use planning - targeting those involved or will be involved in infrastructure development in affinity to inland aquatic ecosystems.
  - d. Public awareness campaign on the negative effects of burning of vegetation and clearing of land for agricultural expansion (nomadic farming).
  - e. Public awareness campaign on the impacts of illegal hunting, illegal wildlife trade, and hunting for bush meat on the biodiversity resources of Timor-Leste.
- Conduct nationwide activities for schools and communities to celebrate the following events through exhibits, public programs and forums, art and photography contests, and other fun activities:
  - a. UN Decade on Biodiversity, 2011-2020
  - b. International Year of Forests, 2011
  - c. World Wetlands Day, 2 February
  - d. World Water Day, 22 March
  - e. Earth Day, 22 April
  - f. International Day for Biodiversity, 22 May
  - g. World Environment Day, 5 June
  - h. World Food Day, 16 October
- Conduct nationwide simultaneous Clean-Up days to promote clean environment and proper waste disposal.
- Organize community and school activities where government officials and the public can jointly plan and participate (local conservation initiatives, tree planting, run or walk for the environment, etc.)
- Disseminate information to communities about sustainable technologies and strategies for effective natural resources management (include alternatives to firewood gathering and other unsustainable practices).

- Establish school and community libraries with sufficient materials (printed and audiovisual) on biodiversity.

### *Schools*

- Organize student volunteer organizations (Environment Youth Guards, Environment Youth Crusaders, Environment Youth Champions, or any attractive name) in all schools who will take the lead in conservation and advocacy activities. School administrations must provide monetary or material support to these volunteer groups until they are able to develop a network of student volunteers for biodiversity all over Timor-Leste. Include the boy and girl scouts in this initiative.
- Conduct youth camps and train student leaders to become advocates of biodiversity conservation.
- Conduct bird-watching expeditions or visits to protected areas for students to develop their appreciation of species and ecosystems.
- Conduct tree planting activities within and around schools through the global Green Wave campaign. (Refer to [www.greenwave.cbd.int](http://www.greenwave.cbd.int) for details.)
- Provide financial and material support to encourage student to conduct mini-research work on biodiversity.
- Conduct school contests (essay writing, quiz, oratorical, art, cultural, photography and other contests) with themes on biodiversity and conservation to make biodiversity a fun subject for the youth.
- Conduct a national contest among school publications on best biodiversity news and feature articles.
- Train school journalists on reporting biodiversity.
- Launch a national campaign for schools to grow organic vegetables and take the lead in communities to practice proper waste management.

### *Communities*

- Encourage District governments to implement a strict campaign on proper waste management, organic farming, protection of species and ecosystems, and against poaching and illegal wildlife trade, forest fires, etc.
- Conduct community forums to explain the values of biodiversity; “socialize” environmental laws including information on endangered species and prohibition of collection and sale of such species; educate the public on the negative effects of over-harvesting and exploitation, pollution, waste management, sustainable management of their local biodiversity resources and ecosystems, and climate change and biodiversity; gather information on indigenous laws on nature and emphasize their importance. To attract people to attend forums, organizer should include exhibits, contests, video showing and other fun activities and incentives to participants.
- Establish District Biodiversity Action Centers that can organize community-level activities on biodiversity conservation and advocacy, including immediate response to reports and complaints on crimes against nature.
- Encourage organizers of cultural, sports and religious activities in communities to adopt biodiversity as theme for their celebrations, events, rituals, etc.
- Encourage religious leaders to include conservation in their religious messages.
- Encourage youth, women, sectoral organizations, and civil society/NGOs to adopt trees, parks, protected areas, forests, rivers, mangroves, which they can develop and protect.

- Organize a national Timor-Leste Coffee Day to promote the country's agro-biodiversity products.
- Organize an Expats Day where UN and expats from different organizations can visit communities to plant trees, teach biodiversity conservation, and exchange views with the local population in protecting and conserving biodiversity.

#### *Recognizing Outstanding Achievers in Biodiversity Conservation and Advocacy*

To inspire partners in biodiversity conservation and advocacy, the Government of Timor-Leste may wish to consider recognizing and rewarding outstanding achievements by sectors such as business, youth organizations, schools, District Governments, communities and media through the Timor-Leste National Champions of Biodiversity Awards.

#### **4.3.4 Implementing the CEPA Strategy and Action Plan**

The Government of Timor-Leste will establish a National CEPA Committee composed of representatives from government, business, media, civil society, academic and scientific organizations who will coordinate planning and implementation of activities identified in this CEPA Action Plan. This will take-off from the CEPA Network established during the NBSAP development process.

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# Annexes

## Annex 1: The Natural Environments, Biodiversity and Ecosystems in Timor-Leste

### A1. Country Profile

#### A1.1.1 Geography, Topography, Geology and Climate

Timor-Leste is part of the Wallacea biogeographic region, which has biographical boundaries of divergent assemblage of plants, birds, mammals, reptiles and insects. Timor-Leste is about 260 kilometers long and up to 90 kilometers wide with a total area of 14,874 square kilometers.

Figure 1 shows the map of Timor-Leste with its districts and sub-districts.

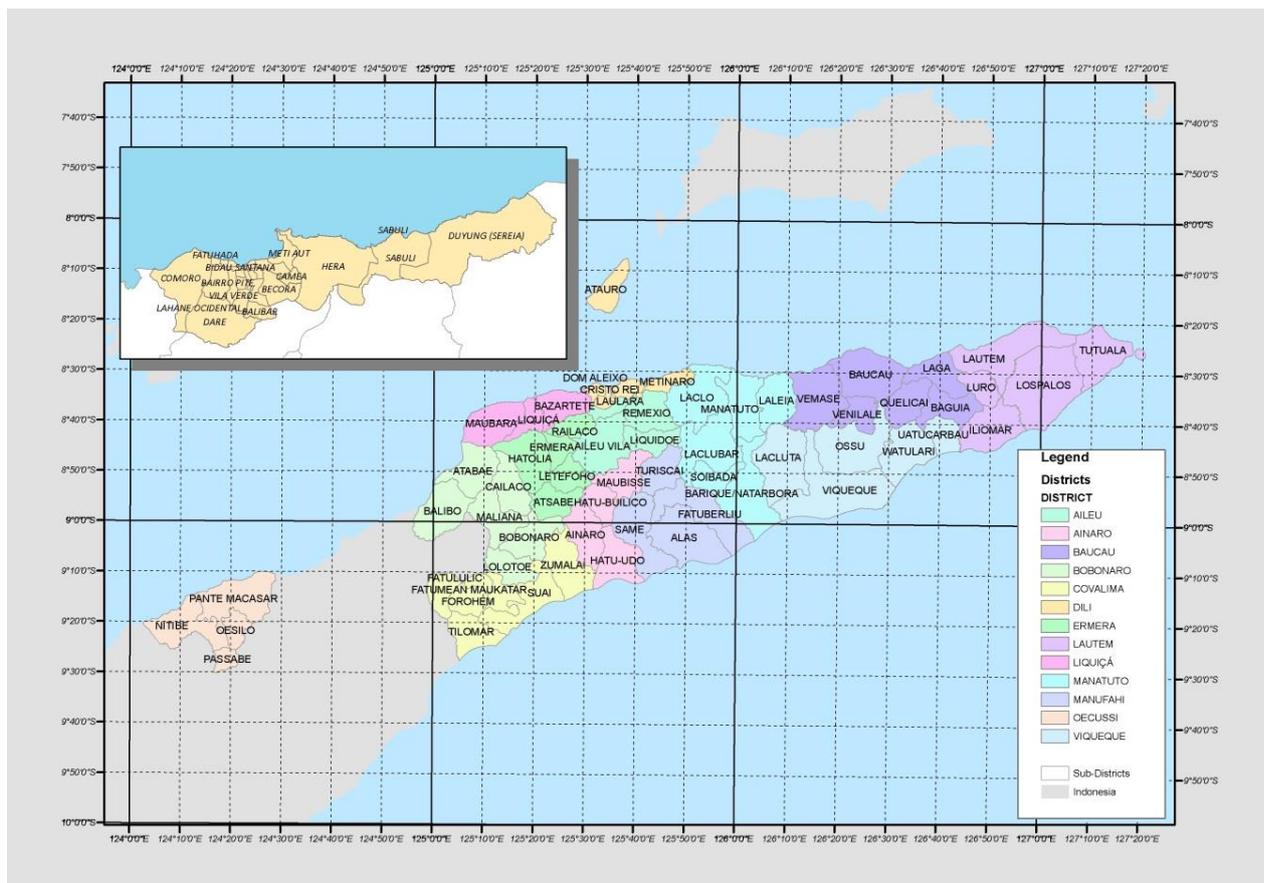


Figure 1. Map of Timor-Leste with districts and sub-districts

The country has a generally steep terrain with slopes ranging from 8 to 25 percent and with less than half of Timor-Leste having steep to very steep slopes (> than 40%). Figure 2 shows the slope map and Figure 3, the land elevation map of Timor-Leste.

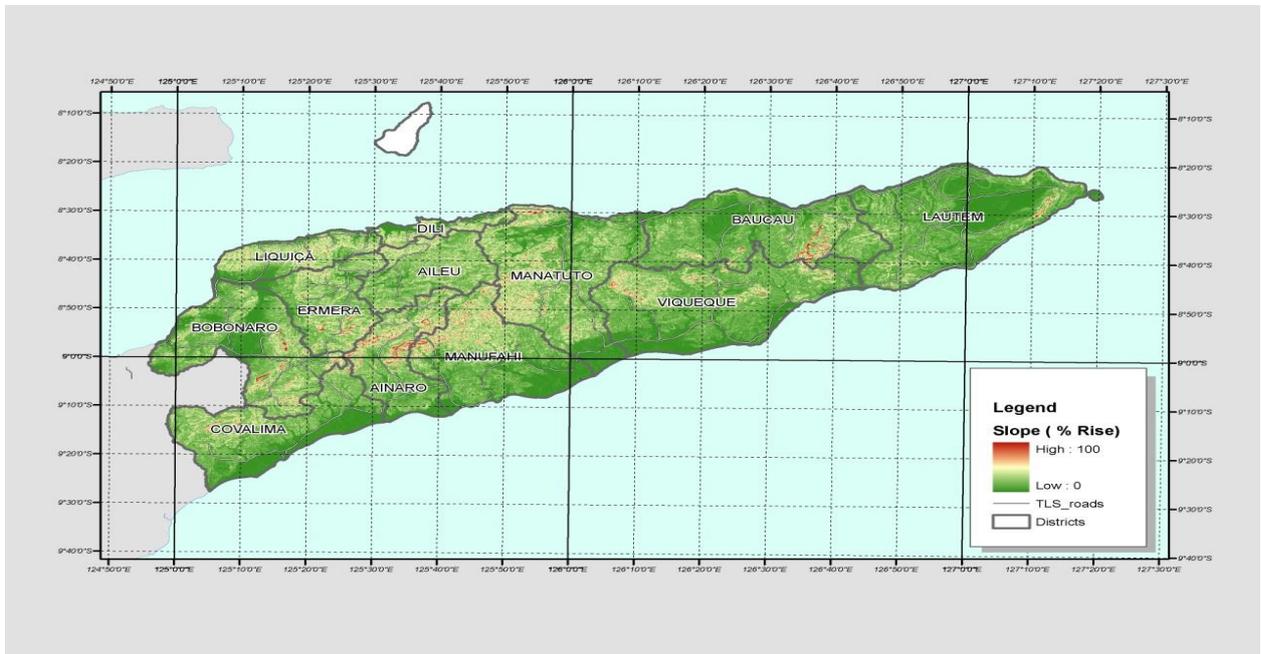


Figure 2. Slope map of Timor-Leste

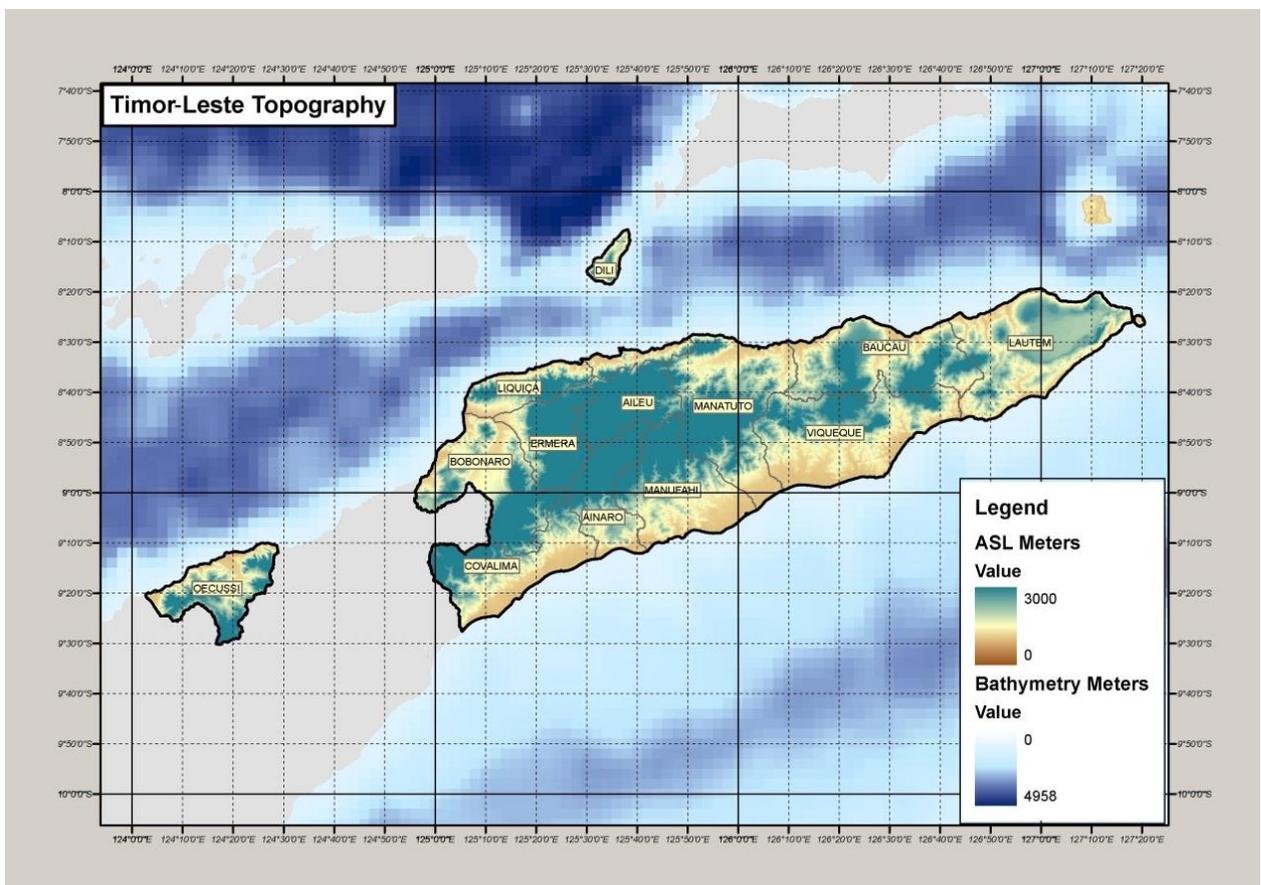
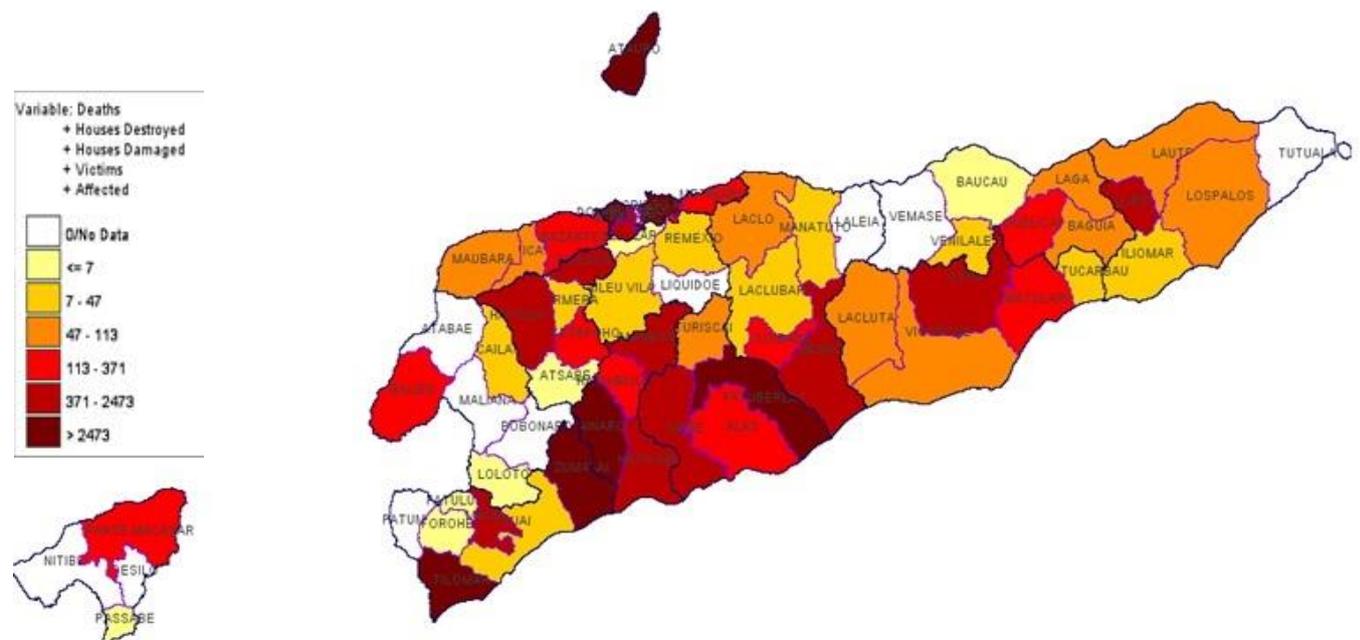


Figure 3. Land elevation map of Timor-Leste

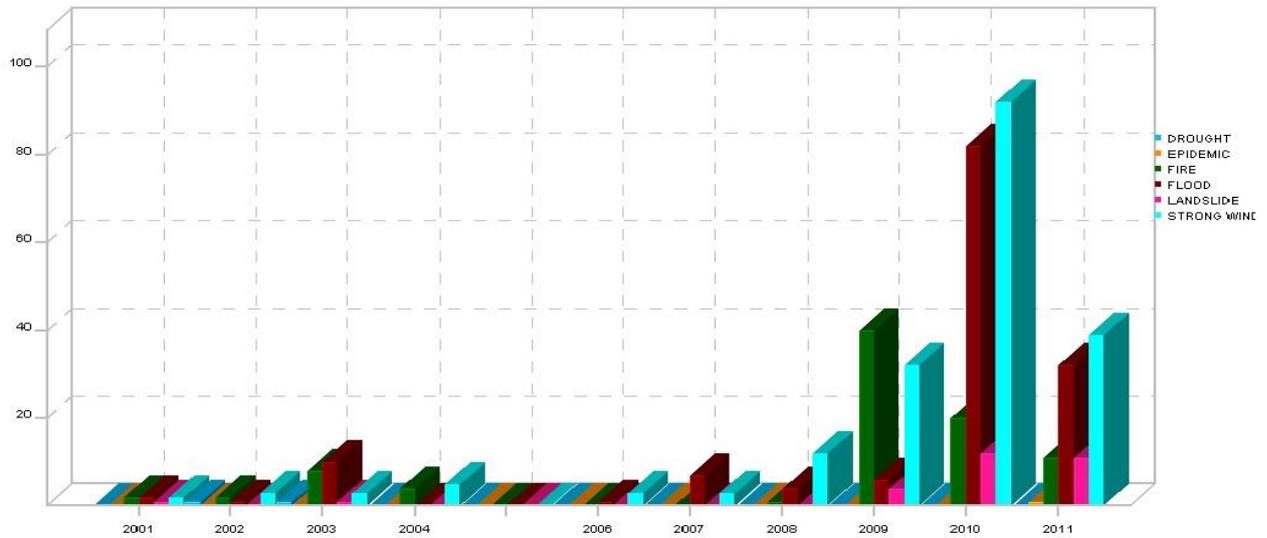
Timor-Leste is the largest and easternmost island of the Lesser Sunda Islands. The bedrock is primarily sedimentary calcareous rock, with fossil coral reefs at high altitude up to 2000 meters above sea level (asl). The soil tends to be relatively thin with a low water-holding capacity. The three major types of soil are: (1) camsoils, which are generally found in the interior mountainous region in the central part of the country; (2) vertisols, which are common in much lower altitude in Covalima, Bobonaro, Viqueque, Manatuto, Baucau and Lautem; and (3) fluvisols, which are predominant in coastal areas in south coast zones.

Timor-Leste's south coast is considered to be "*permanently moist*" with more than 2000 millimeters (mm) of rain for almost nine months of the year. The Northern part is "*permanently dry*" with rainfall of 500-1000 mm per year in four months. Torrential rains are common and the mean annual temperature at sea level is 27.5°C and 19.8°C at 1,432 meters asl. Temperatures are warm to hot during the day, but become cool to cold at night in mountainous areas.

The map below shows evidence of areas in the country that have been affected by multiple hazards (Figure 4). In the past decade (2001 – 2011), Timor-Leste has experienced frequent droughts, floods and strong winds (Figure5).



**Figure 4. Disaster-affected areas in Timor-Leste, 2001-2011**



**Figure 5. Disaster frequency in the past decade** (Source: NDOC NDMD, 2011)

### **A1.1.2 People, Land-use and Economy**

The population of Timor-Leste in 2010 was estimated to be about 1,066,408, with a population growth of 2.41 percent per year. Population by age group shows that 4.1 percent are children, 14 years old and under; 53.9 percent are members of the economically productive segment of the population (15-64 years old); and 4.75 percent are elderly (65+ years old). About 75% of Timorese live in rural areas, a majority of whom derive their livelihoods from agriculture (MAF Draft Medium Term Operation Plan, 2014-18), with an average family holding of about 1.2 hectares of land. Farmers grow rice, maize, cassava, vegetables, fruits, coffee and raise some livestock like pigs, sheep, goats, cattle and buffalos.

A survey in 2004 showed that there were approximately 5,000 fishing households. An estimated 10,000 people are engaged in some level of marine resource capture, of which four percent are full time and 96 percent are occasionally engaged in fishing.

There is now an increasing trend of migration from rural to urban centers, particularly towards Dili, the country’s capital. Urban population was 316,086 in 2010 with a density of 352 persons per square kilometer. In 2004, it was reported that Timorese women were having an average of 7.8 children with maternal mortality sustained at high levels due to



**Traditional house in Timor-Leste.**

limited access to health care. The percentage of underweight children under five was 48.6 percent in 2007. The net enrollment ratio peaked at 75 percent in 2004 but declined in subsequent years.

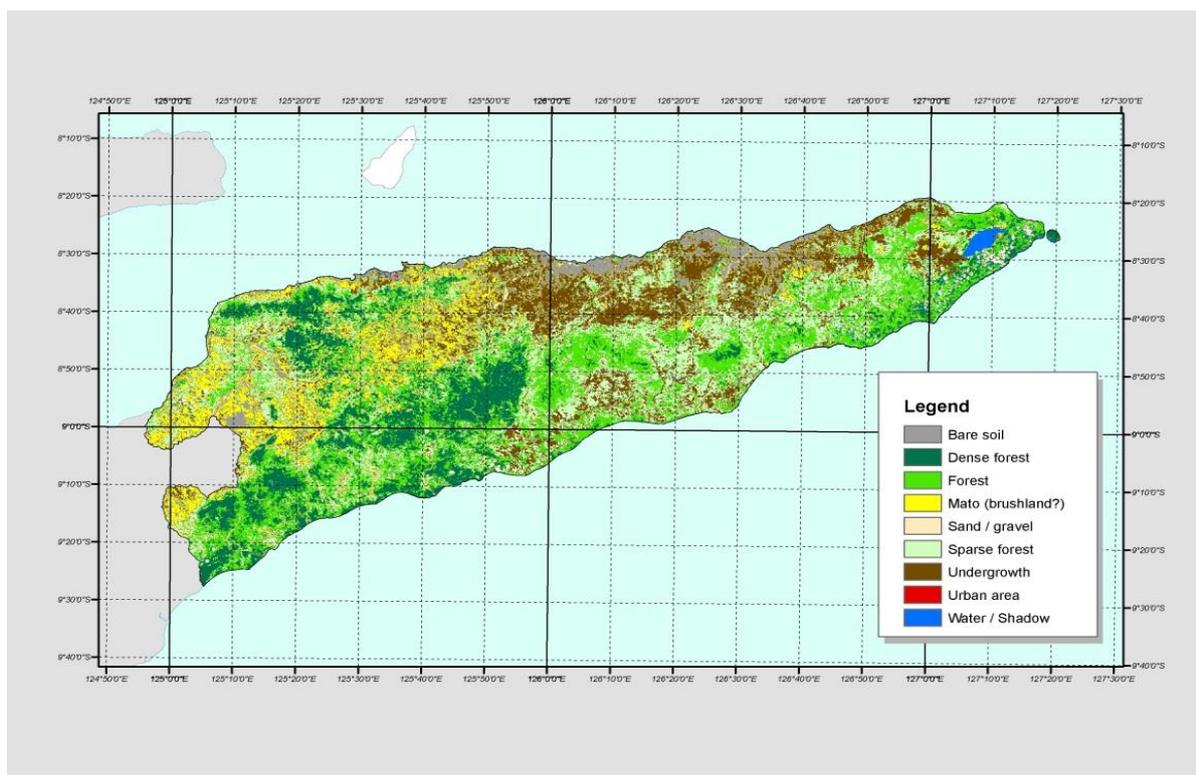
Dominant land uses are shifting cultivation or swidden agriculture, and pasture lands for grazing by goats, sheep, cattle, buffalo and horses. Main cereal crops include rice and maize while the major cash crop is coffee.

Before 1999, land-use designations included parks/reserves, watershed protection forest, production forest, convertible forest and non-forestland. About 50 percent are convertible forests or have forest cover that could be removed and replaced by crops or plantations. In 2001, Timor-Leste was 74 percent forested and only 16 percent was allocated as agricultural land, as shown in Table 1. Figure 6 shows the land cover map of Timor-Leste in 2001.

**Table 1. Land use category of Timor-Leste in 2001**

Land use category	Area (sq km)	Percentage
Forested land	11,001.420	73.75
Non-productive dry land	532.408	3.57
Non-productive wetland	7.787	0.05
Agricultural land	2,418.863	16.32
Commercial agriculture	649.966	4.36
Aquaculture	0	0.00
Villages and scattered gardens	104.638	0.70
Settlements and industrial land	141.249	0.95
Lakes	60.436	0.41
<b>Total</b>	<b>14,916.767</b>	<b>100.00</b>

*Source: FAO 2004.*



**Figure 6. Land cover map of Timor-Leste**

Timor-Leste's economy is dependent on its land, water, and forest resources and coastal zones. The country has minerals and petroleum deposits that can provide a significant source of income and foreign revenue in the years to come. The domestic economy is based on subsistence agriculture, which is the main source of livelihood. There is very little agro-processing or agricultural diversification.

## **A 2 Status and Trends of Biodiversity**

### **A1.2.1 Natural Environments**

The distribution of Timor-Leste's vegetation types varies considerably between north and south. Its northern coast is predominantly dry and dominated by arid woodlands, except east of Lautem where it is densely forested. Some areas such as those around Dili are characterized by denuded hills with patches of grass and bushes. The coastal area, north of Timor-Leste, is characterized by steep rocky hills and some areas having very narrow coastal plains except for areas around Manatuto and Dili. Patches of dense and sparse moist lowland forests dominate the southern coast. These moist lowland forests tend to be separated from the southern coastline by small patches of coastal forests and large patches of dry arable land where food crops are grown, with the exception of the southeast where the moist lowland forest extends to the coastline. Figure 7 shows that forests and grasslands dominated land cover based on 2010 data (SLMP, 2010).

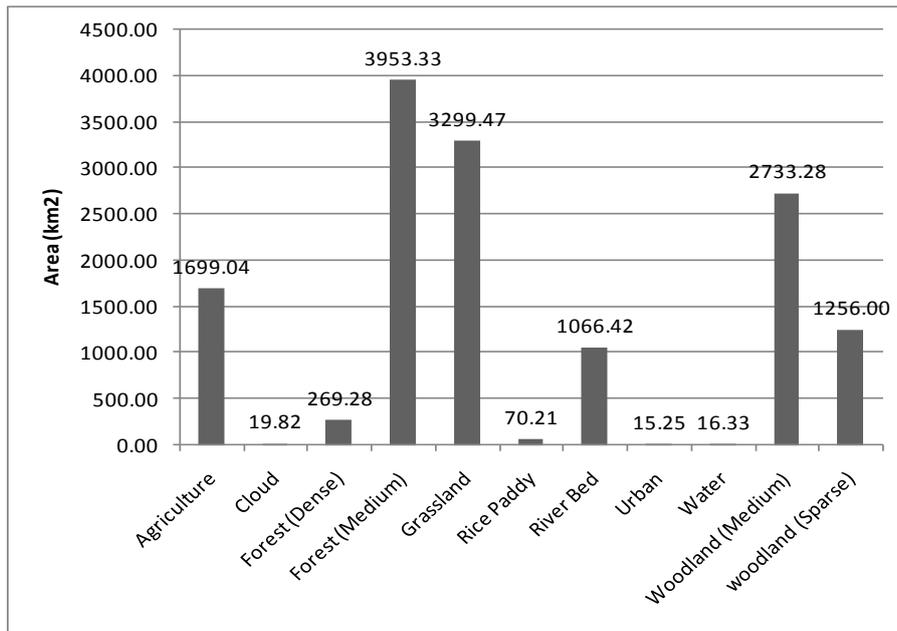


Figure 7. Area of each major land class (Source: SLMP, 2010)

### Forests and Mountains

These areas are characterized by steep terrain with altitudes of 600 meters and above. Temperatures are below 24°C. Rainfall is above 1,500 mm and the dry season lasts four months. The original vegetation is semi-evergreen forest, moist deciduous forest or non-deciduous forest (Figure 8). Landslides are frequent during the rainy season, partly due to the conversion of steep slopes for agriculture. Large tracts of very steep slopes have been cultivated and are very vulnerable to landslides during the rainy season. Several sites are protected by UNTAET Regulation 2000/19.

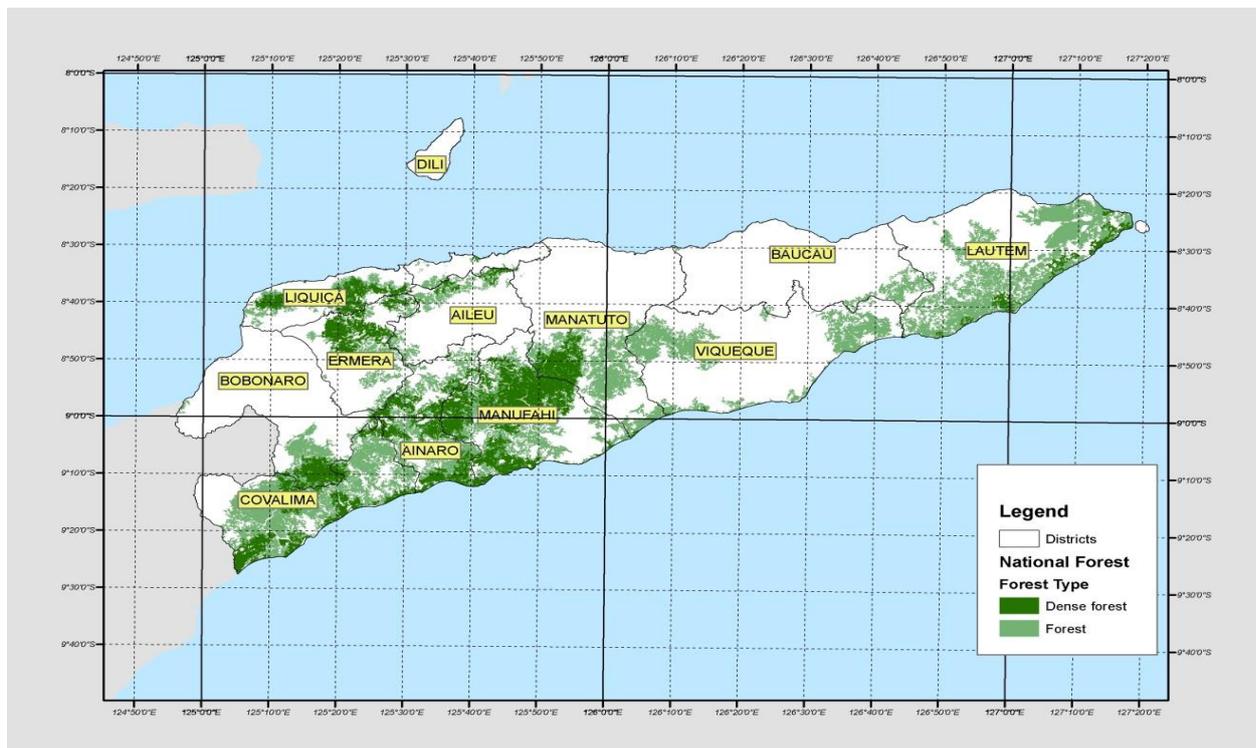


Figure 8. National forests in Timor-Leste

Forests and mountains play an important role in water flow. There are 10 major watersheds in Timor-Leste, namely, Laclo, Loes, Caraulun, Seical, Tavara, Irabere, Comoro, Tono, Sahe and Nunura. Vegetation cover in steep slopes helps prevent landslides, flooding, erosion and droughts. The area contributes to primary and secondary productivity. Montane areas are noted for their high levels of endemism, with several endemic montane forest species. Table 3 shows most of Timor-Leste's forests were classified as lowland forests in 2000 with only a few hectares of man-made forests.

Some facts about Timor-Leste's forests and mountains

- Steep terrain with altitudes of 600 meters above sea level
- Ten major watersheds: Laclo, Loes, Caraulun, Seical, Tavara, Irabere, Comoro, Tono, Sahe and Nunura
- In 2010, forests were designated for conservation of biodiversity (25 percent); production (33 percent); and protection of soil and water (42 percent)
- Dominant native species include *Eucalyptus alba*, *E. urophylla*, *Pterocarpus indicus*, and *Santalum album*

**Table 2. Classified and sub-classified forests of Timor-Leste in 2000**

Site Classes	Sub-Classes	Area (hectares)
Lowland forest < 1000m asl	Moist lowland forest – dense	261,694
	Moist lowland forest – sparse	174,992
	Dry lowland forest – mainly one species	135,720
	Dry lowland forest - mixed composition	189,080
Highland forest 1000 – 2000m asl	Moist mixed forest	65,103
	Single species forest	2,356
Montane forest >2000m asl		2,611
Protected areas		187,000
Man-made forest	Teak	918
	Other commercial plantings	
	Woodlots	

Source: FAO, 2005.

Forests and mountains contribute to primary and secondary productivity. Lowland areas typically have the highest degree of biodiversity in tropical areas. However, most of the forest cover has been degraded or eliminated through human activities and the small remaining areas of forests probably harbor the remaining biodiversity.

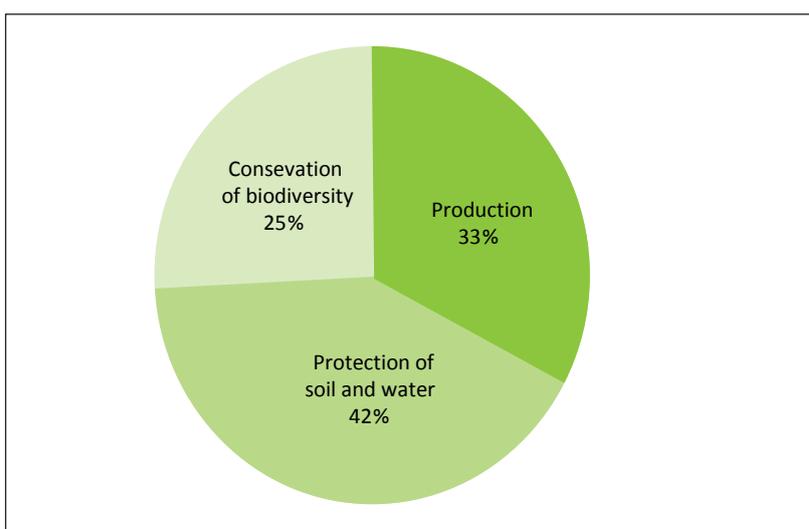
In rural areas, economic activities that utilize forestry products include fuelwood gathering, hunting, collecting palm wine, and producing palm stem panel for house walling. The excessive gathering of these products in forest areas in low rainfall zones has subsequently converted these areas to grasslands and savannas. Some of these habitats occur naturally in areas of low rainfall and specific soil factors such as seasonally inundated floodplain with an associated sedge land at Lake Iralalaru. Other grasslands are extensive on degraded lands and on fertile soil plateaus and plains near Los Palos and Maliana. Forest areas and other ecosystems have been designated to serve specific functions such as production, protection of soil and water, and biodiversity conservation (Table 3).

**Table 3. Uses and functions of forest areas and other ecosystems in Timor-Leste**

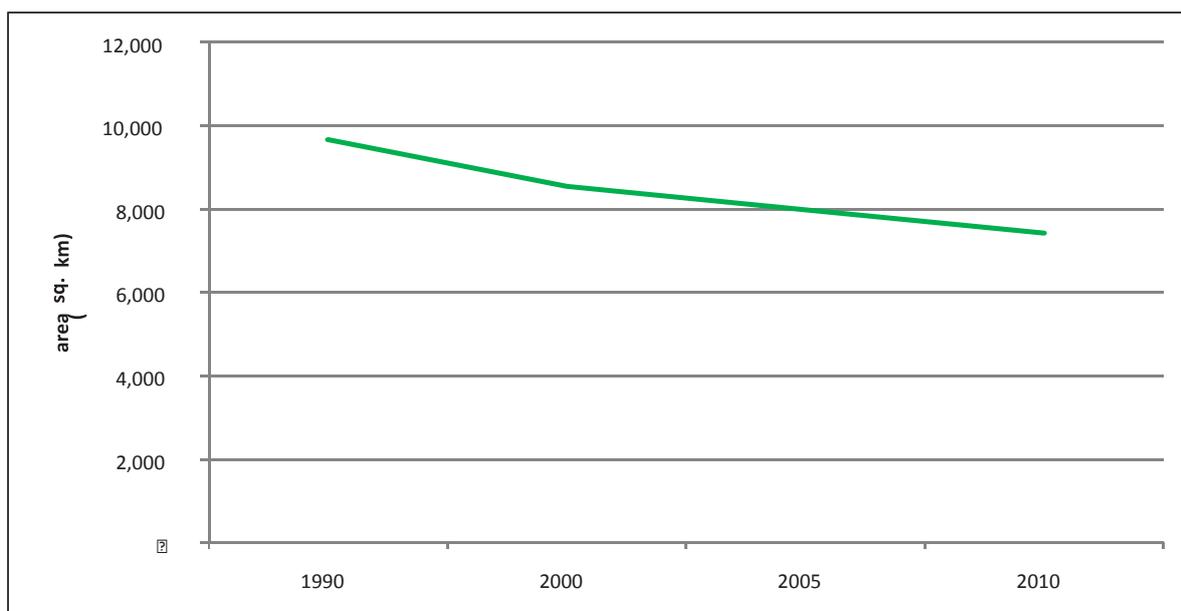
Designated functions	Forest Designations
Production	Forests/other wooded land designated for production and extraction of forest goods, including wood and non-wood forest products
Protection of soil and water	Forest/other wooded land designated for soil and water protection
Conservation of biodiversity	Forests/other wooded land designated for conservation of biological diversity
Social services	Forests/other wooded land designated for provision of social services
Multi-purpose	Forests/other wooded land designated for any combination of production of goods, protection of soil and water, conservation of biodiversity and provision of social services; these areas are all equally and significantly important.
No or unknown functions	Forests/other wooded land for which a specific function has not been designated or where designated function is unknown
Protected natural areas	UNTAET Regulation 2000/19 on Protected Places has declared 15 protected Wild Areas (commonly known as Protected Natural Areas or PNAs). These areas cover 187,600 hectares and provide protection to a range of threatened species. Sites were selected based on preliminary information on their ecological, historical, cultural and religious significance.
Watershed	Watersheds were identified based on topographic conditions
Industrial tree plantation	Identified based on species composition

In 2010, about 25 percent of Timor-Leste's forests were designated for conservation of biodiversity, 33 percent for production and 42 percent for protection of soil and water (Figure 9).

The trends in forest area from 1990 to 2010 showed an approximate decrease of 2000 square kilometers over a 10-year period (Figure 10). Records show that the area for production forests experienced the most significant decline from 1990 - 2005 (FRA 2005) (Table 4).



**Figure 9. Distribution of forest area by primary designated**



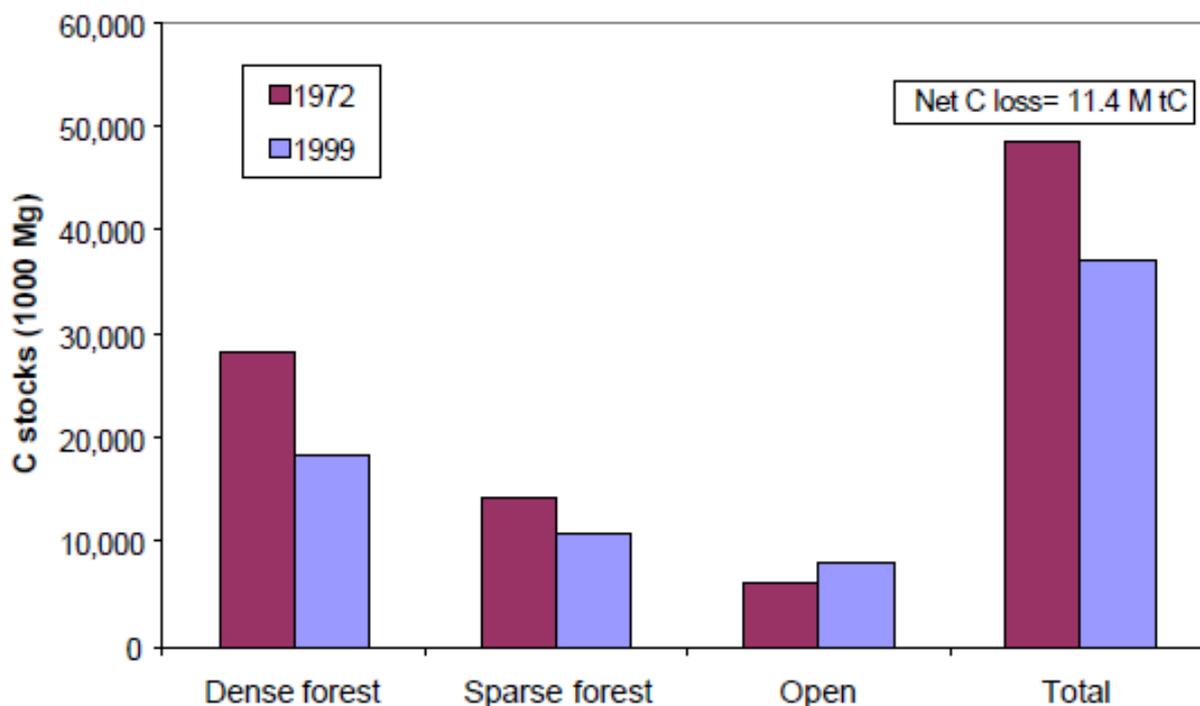
Source: UN Global Forest Resource Assessment, 2005 and 2010. UNEP-WCMC. State of the World's Forest

**Figure 10. Trends in forest area in Timor-Leste in 1990-2010**

**Table 4. Trends of forest area by function from 1990 – 2005**

FRA Categories/Designated Function	Area ('000 hectares)					
	Primary Function			Total Area with Functions		
	1990	2000	2005	1990	2000	2005
Forest						
Production	322	284	138	322	284	138
Protection of soil and water	542	468	473	644	570	660
Conservation of biodiversity	102	102	187	644	570	660
Social services						
<b>TOTAL FORESTS</b>	966	854	798			

From 1972 -1999, Timor-Leste's forest cover rapidly declined by about 200,000 hectares or a loss of 30 percent of total forest area. It was estimated that during that period, 11.4 TgC were emitted into the atmosphere as a result of deforestation (Figure 11).



Source: Godinho *et al.* 2003

**Figure 11. Decline in carbon stocks in forest lands from 1972 – 1999**

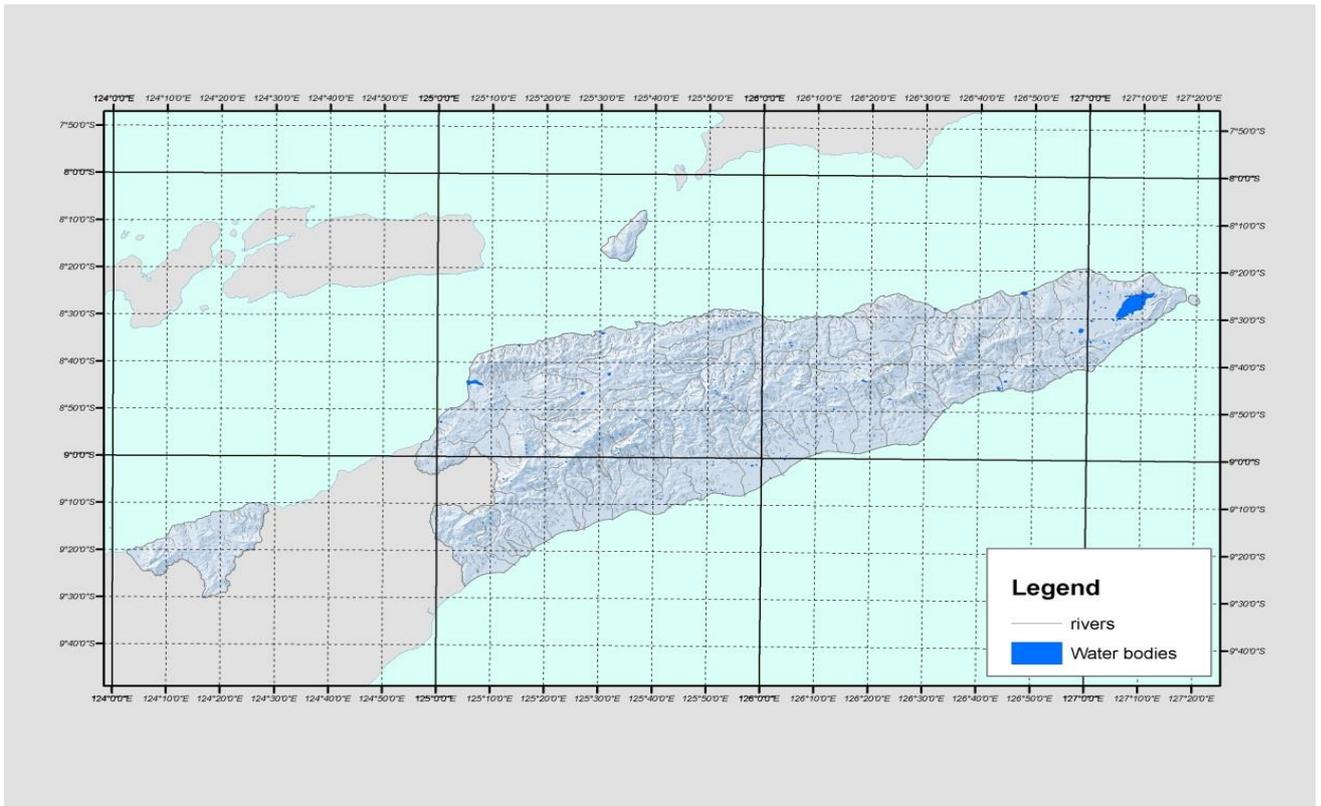
Woodlands and savannas occur extensively along the north coast from sea level to low-mid altitudes. These include savanna woodlands with an open, low-over storey dominated by *Eucalyptus alba*, palm and/or acacia. Open forest dominated by medium to tall *E. urophylla* is found at higher altitude. Coffee plantations with the shade over-storey trees *Paraserianthes falcataria* and *Casuarina junghumiana* are widespread above 600 meters elevation in Bobonaro, Ermera, Liquica, Aileu and Same districts. *Tectona grandis* plantations occur widely but are usually not extensive. Village lands provide simplified habitats for coconut palms and orchards of fruit trees, vegetables and numerous flowering plants.

### **Wetlands, Freshwater Rivers and Lakes**

There are over a hundred rivers in the country, but out of the main river systems, 12 are in the north and 17 are in the south (Figure 12). Only a few rivers flow regularly throughout the year, often drying out and forming pools of stagnant water in the dry season. There are more perennial rivers in the south because of the presence of larger catchment areas, more rainfall and prevailing winds. These are important sources of water for domestic use and irrigation. The largest river system in the country is the Loes River, which is on the northern side of the mountain. Some rivers are ephemeral, often drying up completely during the dry season. The rivers harbor a diversity of aquatic habitats.

#### Some facts about wetlands, freshwater rivers and lakes

- Largest river system is Loes River.
- There are 24 key wetland sites.
- One of the most significant wetlands is Lake Iralalaru with large areas of relatively undisturbed forests.
- Lake Modo Mahut is near sea level.



**Figure 12. Wetlands, freshwater rivers and lakes in Timor-Leste**

There are few lakes and these are relatively small. One of the most significant wetlands is Lake Iralalaru, the basin of which is surrounded by extensive and relatively well-preserved forests. Around the Lake, cultivation and cattle grazing is prominent whereas the north, east and south sides of the Lake are large areas of relatively undisturbed forests. The Lake harbors a number of species including crocodiles. Another significant lake is Lake Modo Mahut, which is near sea level and on the southern coastal plain.

A survey conducted in 2007 had identified 24 key wetland sites that are environmentally significant and in need of conservation and resource management (Table 5). These wetlands are of national significance in Timor-Leste and harbor threatened and near-threatened birds.



**Iralalaru Lake**

**Table 5. Wetlands of national significance in Timor-Leste**

No.	Site	Habitats	Total No. of Species (T & NTS)	Threatened and Near Threatened Species (T & NTS)
1	Tasitulo (IBA)	Saline lakes, mudflats, beach	59 (31)	Malayan Plover ( <i>Charadrius peronii</i> ) Black-tailed Codwit ( <i>Limosa limosa</i> )
2	Seical	Estuary, mangroves, mudflats	51 (260)	Beach Thick-knee ( <i>Esacus giganteus</i> ) Malaysian Plover ( <i>Charadrius peronii</i> ) Black-tailed Codwit ( <i>Limosa limosa</i> )
3	Lake Iralalaru (Part IBA)	Freshwater lake, swamps, stream	51 (20)	Malayan Plover ( <i>Charadrius peronii</i> ) Black-tailed Codwit ( <i>Limosa limosa</i> )
4	Lake Laga	Saline lake, beach	39 (250)	Malayan Plover ( <i>Charadrius peronii</i> ) Black-tailed Codwit ( <i>Limosa limosa</i> )
5	Loes river estuary	Braided stream, estuary, mudflats	41 (20)	Beach Thick-knee ( <i>Esacus giganteus</i> ) Malaysian Plover ( <i>Charadrius peronii</i> )
6	Manatuto mudflats	Mudflats, mangrove, fishponds	39 (11)	Malaysian Plover ( <i>Charadrius peronii</i> )
7	Tibar aquaculture	Mudflats, mangroves, fishponds	35 (22)	Malayan Plover ( <i>Charadrius peronii</i> ), Black-tailed Codwit ( <i>Limosa limosa</i> )
8	Lake Be Malae (Part of IBA)	Shallow saline lake, estuary	35 (15)	Malaysian Plover ( <i>Charadrius peronii</i> )
9	Dili foreshore	Beach, estuary	30 (12)	
10	Lore coast (part of IBA)	Beach, exposed reef	27 (13)	Beach Thick-knee ( <i>Esacus giganteus</i> ), Malaysian Plover ( <i>Charadrius peronii</i> ),
11	Comoro estuary	Beach, Gravel river channel	24 (14)	Christmas Island Frigatebird ( <i>Fregata andrewsi</i> ), Malaysian Plover ( <i>Charadrius peronii</i> )
12	O'Swamp	Spring feed marsh, reedbed, short grass	23 (18)	
13	Lake Welenas and Lake Welada (Part of IBA)	Freshwater lake	23 (2)	
14	Lake Eraulo	Freshwater marsh	23 (7)	Black-tailed Codwit ( <i>Limosa limosa</i> )
15	Raumoko	Beach, exposed	21 (11)	Malaysian Plover ( <i>Charadrius</i>

	estuary	reef		<i>peronii</i> )
16	Vero river (Part of IBA)	Beach, exposed reef, small estuary	20 (11)	Beach Thick-knee ( <i>Esacus giganteus</i> ) Malaysian Plover ( <i>Charadrius peronii</i> )
17	Lake Maubara	Shallow saline lake	20 (9)	
18	Lake Selo	Freshwater marsh	18 (8)	Black-tailed Codwit ( <i>Limosa limosa</i> )
19	Dili sewerage	Treatment ponds	17 (10)	
20	Jaco Island (Part of IBA)	Beach, exposed reef	17 (7)	Beach Thick-knee ( <i>Esacus giganteus</i> )
21	Areia Brance beach (Part of IBA)	Mangrove, mudflats, beaches	17 (5)	Christmas Island Frigatebird ( <i>Fregata andrewsi</i> )
22	Lake Modo Mahut (part of IBA)	Freshwater lake	15 (3)	
23	Hera	Mangrove, mudflats, sandflats	12 (5)	Asian Dowitcher ( <i>Limnodromus semipalmatus</i> )
24	Irabere estuary (part of IBA)	Beach, estuary	10 (4)	Beach Thick-knee ( <i>Esacus giganteus</i> ) Malaysian Plover ( <i>Charadrius peronii</i> )

Source: Trainor, et al. 2007

Wetlands, freshwater rivers and lakes are protected by UNTAET Regulation 2000/19. Efforts are underway to declare Lake Iralalaru Basin Area as a Man and Biosphere (MAB) reserve. These habitats are essential to water quality and abundance, contribute to nutrient cycling and primary and secondary productivity. These areas are also essential to maintaining quality of life and agriculture, and essential for migratory bird species, endangered bird species and endemic fish species.

### **Agriculture**

Of Timor-Leste's total land area, 600,000 hectares are suitable for cropping and livestock production. Around 174,000 hectares have been estimated to be arable with an additional 124,000 hectares of bush cover. However, only 30 percent of the suitable land is cropped. Farming methods used are a combination of subsistence and commercial approaches. Rice is commonly cropped in warmer lowland areas, maize is grown in medium altitudes, and root crops are grown at higher altitudes.

Highland plains with elevations between 300 and 700 meters asl are dominated by agricultural lands, particularly irrigated for rice production. Ground water levels are low and the low water retention attributes of the soil types contribute to flooding during the rainy season. This area is of high economic importance, contributing approximately 21 percent or US\$14,925,000 in ground and tree crops in 1997. This is the most important agricultural area. The highland plains differ significantly in soil types and water availability. Large parts of the Maliana plains are cultivated for irrigated rice production and will in normal years, constitute an important part of the "bread basket" of Timor-Leste. The plains along Los Palos are mainly used for grazing. The soil types cause the area to be swampy in the rainy season, while the clayey soils dry out and crack in the dry season. The plains around Baucau airport are generally

drier and less cultivated. The ground water is low, so that while people in the escarpment (Baucau town and towards the sea) have abundant water all year round, people on the plains have to dig deep wells to access water during the dry season. Some moist lowland areas, originally covered mainly by moist deciduous forest, semi-evergreen forests or rain forests, were converted to cultivated lands, plantations and secondary vegetation.

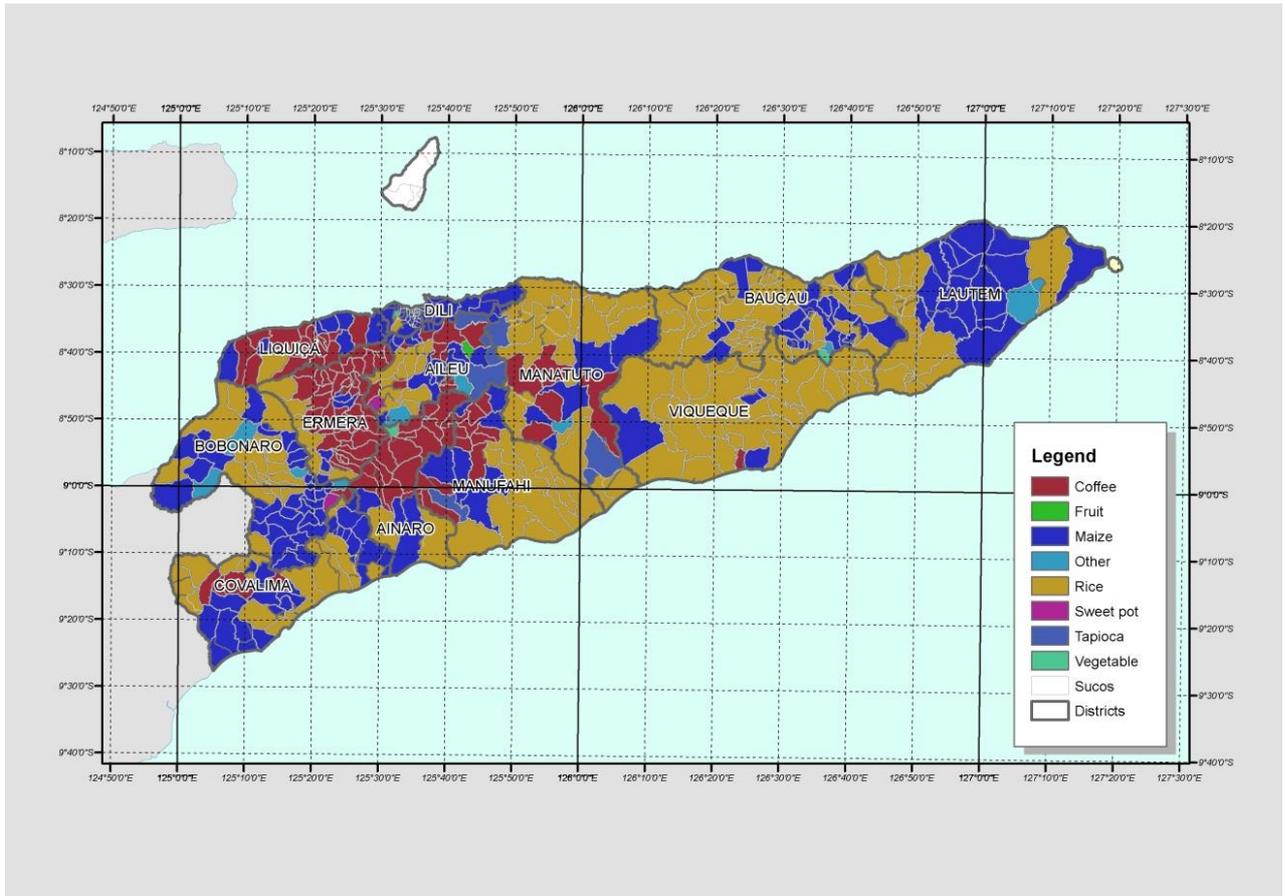


**Agricultural farms in Timor-Leste**

The systems adopted locally depend on the climatic and topographical conditions of the area, as well as market conditions. Generally, irrigated rice producers cultivate corn simultaneously, as in Maliana. In cattle-dominated areas like Oecussi, swidden cultivation and home gardening are prevalent. In the central highlands and mountainous areas such as Emera and Liquica, coffee production is combined with pastoralism, irrigated rice production and non-irrigated production of other food crops. Coffee and other cash crops like vanilla, might even alternate with food crop production on the same piece of land. Crops grown in agricultural lands are primarily rice, maize and coffee (Figure 13).

#### Some facts about agriculture

- The highland plains are the most important agricultural area planted to rice, maize, cassava, coffee, beans, vegetables and fruits.
- Slash-and-burn or swidden agriculture is widely used.
- About 63 percent of the households are engaged in crop production.
- In 2010, about 80 percent of the households rear livestock like goats, sheep, pigs, cattle and buffalos.



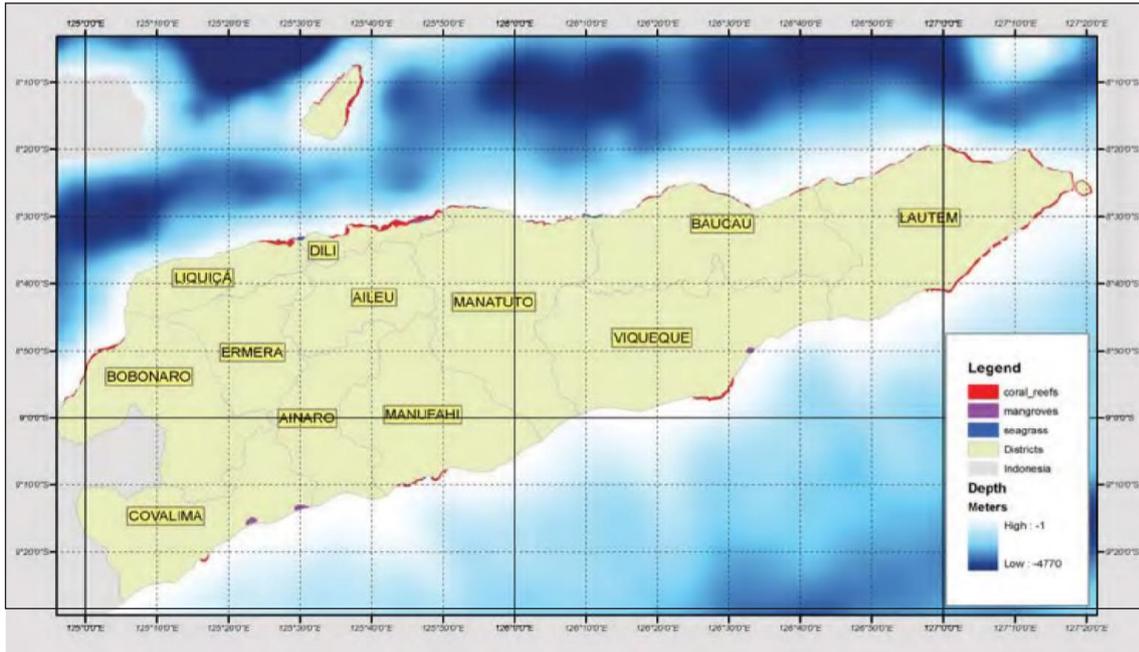
**Figure 13. Main crops in agricultural lands**

**Marine and Coastal Zones**

Marine and coastal zones include the mangrove and other specialized coastal vegetation, shallow seas adjacent to land, coral reefs and seagrass beds (Figure 14). Mangroves and coral reefs are protected by UNTAET Regulation 2000/19. Some mangroves are also protected under traditional practices (*Tara bandu*). Saltwater lakes are found in some areas such as in the sub-district Laga of Baucau district.



**Saltwater Lake in Laga, Baucau**



**Figure 14. Distribution of mangroves, seagrass beds and coral reefs in Timor-Leste**

Timor-Leste is part of the Coral Triangle Initiative, the center of marine biodiversity and home to 75 percent of all known coral species, more than 3,000 species of reef fishes, six of the seven known turtle species, whale sharks, manta rays and a diverse array of marine mammals such as 22 species of dolphin, and a variety of whale species.

Timor-Leste has a coastline of approximately 700 kilometers long and a potential exclusive economic ocean zone (EEZ) of approximately 75,000 sq km. The habitats along the coastline change due to seasonal rainfall, local geology and topography, river discharges and regional offshore oceanographic features and the impact of human occupation.

**Some facts about marine and coastal zones**

- Timor-Leste's coastline is approximately 735 km long.
- Potential exclusive economic ocean zone is approximately 75,000 sq km.
- Seven genera of mangroves were observed.
- Timor-Leste is part of the Coral Triangle.



**Part of the 700-kilometer long Coastline of Timor-Leste**

The coastal zone of Timor-Leste has the following biotopes: 1) oceanic and sub-tidal marine environment, which includes pelagic water columns, deep-sea bottoms, shallower rocky bottoms, sandy-muddy bottoms, seagrass beds and coral reefs; 2) the intertidal zone, which includes rocky intertidal shelves, sandy-muddy tidal flats and mangrove forests; 3) shorelines, which include sandy beaches, dunes, rocky outcrops, limestone cliffs, river estuaries, and brackish lagoons; 4) near-shore zone that includes coastal dry lands, natural forests and wetlands; and 5) the north coast, which has most coral reefs, seagrass and mangrove habitats.

### **Mangroves and Seagrasses**

Mangroves protect the coastline from erosion and coral reefs from sedimentation and, along with seagrasses and coral reefs, are the primary breeding grounds for many fish and shellfish species. The country's mangroves occupy approximately 750 hectares, with the largest stand found in the Metinaro region.

Mangrove forests appear relatively intact in Timor-Leste. Seven genera were observed: *Avicennia*, *Sonneratia*, *Rhizophora*, *Bruguiera*, *Ceriops*, *Lumnitzera* and *Xylocarpus*. Palms such as coconuts (*Cocos nucifera*), nipa and pandan are also present. Some clearing of an area of *Ceriops tagal* trees was observed in Ossuleo, about 10 km east of Dili, but most of the larger trees appear undamaged. People in Timor-Leste are aware that mangroves are important sanctuaries for fish, prawns and shrimps and should be protected. However, some mangrove trees are cut for firewood and mangrove areas are cleared for aquaculture (prawns). A few ponds of prawn (*Penaeus monodon*, *P. semisulcatus* and *P. mergulensis*) can be found behind some mangrove fringes along the northern shores of Timor-Leste.



**Mangroves in Manatuto**

Salt is extracted in the barren salt flats naturally occurring behind mangrove fringes, and salt evaporation ponds have been constructed in some areas.



**Salt production and packaging in Timor-Leste**

Seagrass beds protect coral reefs from sedimentation and provide feeding grounds for the endangered dugong (*Dugong dugon*). The shallow portions of the narrow reef flats of Timor-Leste are populated by seagrasses. The coastal area is extremely important in the conservation of marine biodiversity and endangered marine species such as turtles, dugong and dolphins



**A portion of Coastal Area**

### **Coral Reefs**

Fringing coral reefs form an almost continuous strip along the coastal waters west of Timor-Leste. The area of Nino Konis on the eastern tip of Timor-Leste has been promoted as a potential site of importance for coral reef conservation. Jaco Island is within the proposed area of conservation and is covered with well-developed forests. The Island is uninhabited. According to traditional rules, all access is forbidden; hence the stand has not been exploited. The surrounding marine area has well-established coral colonies, which appear to be intact. Accordingly, the passage of water east and around Jaco Islands is a favored habitat for large pelagic fishes.

### **Fisheries**

Timor-Leste has an abundance of fish stocks, particularly inshore species. Off-shore, there are demersal fish stocks in commercial quantities. Most of these stocks are shared with Australia and Indonesia.

The community of Atauro Island is particularly skilled in fishing and has been a major supplier of fresh fish to Dili. Fishing methods include use of fish traps, spear, hook and line and gill nets targeting reef and deep water fish species such as snappers, coral trout and small pelagic species of tuna. Recently, octopus and lobster are caught.

In 1997, fisheries contributed approximately US\$ 481,000, less than one percent of all revenues generated. Generally, Timorese fish is for partial subsistence.

### **Protected Areas**

Protected areas have high national or international value and are being managed to protect a country's natural and cultural heritage. The Directorate of the Environment within the Ministry of Environment and Development is the lead agency for the management of protected areas. Timor-Leste has 15 protected areas designated under UNTAET Regulation 2000/19. These are:

<b>Protected Area</b>	<b>Area Coverage and Description</b>
1. Nino Konis Santana National Park (NPSNP)	Declared under Resolusaun do Governo No. 8/2008 Kriaand under UNTAET 19/2000; includes the total area of Jaco Island together with surrounding rocks, and other surface and subsurface features; Tutuala Beach together with forest adjacent to the beach; and the Lore Reserve. The National Park covers approximately 11,000 hectares.
2. Cristo Rei	Includes the hinterland
3. Tata Mailau Mountain,	The summit and all elevations above 2000 meters and the surrounding forest, cover an area of approximately 20,000 hectares
4. Sadoria Mountain	The summit and all elevations above 2000 meters and the surrounding forest
5. Malobu Mountain	The summit and all elevations above 2000 meters and the surrounding forest
6. Mount Diatuto	The summit and the surrounding forests cover an area of approximately 15,000 hectares. A preliminary survey was conducted and a consultation was held with the community
7. Mount Fantumasin	The summit and the surrounding forests cover an area of approximately 4,000 hectares
8. RiverletClere Sanctuary	The Sanctuary has an area of approximately 30,000 hectares.
9. Tilomar Reserve	The Reserve is approximately 12,800 hectares; with complete demarcation.
10. Monte MundoPerdido	Monte Mundo Perdido, with the surrounding forest, has an approximate area of 25,000 hectares.
11. Monte Matebian	The protected area is approximately 22,000 hectares, covering the summit, all elevations above 2000 meters and the surrounding forest.
12. Monte Cablaque	Monte Cablaque and the surrounding forest covers an area of approximately 18,000 hectares
13. Manucoco Reserve	The Reserve covers an area of approximately 4,000 hectares. A preliminary survey was conducted and a consultation was held with the community.

### Nino Konis Santana National Park (NKSNP)

- Declared as Timor-Leste's first national park through *Resolução do Governo No. 8/2007* Kria & UNTAET 19/2000.
- Covers a total area of 123,600 hectares (68,000 ha land and 55,600 ha sea).
- Has well-developed tropical closed forest especially in Tutuala, mehera and Com
- Harbors significant biodiversity which has high natural heritage value
- Area of outstanding cultural heritage value
- The park incorporates 3 protected wild areas into one

In 2007, the Department of Protected Areas and National Parks (DPANP) identified 17 additional landscapes that will be protected. The landscapes were chosen by identifying forest ecosystems that are in good condition and/or likely to become degraded or deforested. Other criteria used are the presence of threatened species and high conservation value of the area such as Important Bird Areas (IBAs), watershed and water source protection. These newly identified areas for protection are: 1) Mangal Citrana, 2) Mount Cutete, 3) Mount Taroman, 4) Mount Guguleur, 5) Mount Loelako, 6) Mount Tapo/Saburai, 7) Lake Maurei, 8) Mount Bibileo, 9) Mount Burabo, 10) Mount Kuri, 11) Lake Modomahut, 12) Mount Aitana, 13) Mount Builo, 14) Mount Laretame, 15) Mount Legumau, 16) Mount Manoleu, and 17) Lake Melenas (Figure 15).

### Some facts about Timor-Leste's protected areas

- Thirty designated protected and conservation areas
- Nino Konis Santana National Park, the first national park of Timor-Leste, and the largest one, includes the Jaco Island, Lore Reserve and the Tutuala Beach (UNTAET 19, 2000)
- Potential for eco and marine tourism, historic and cultural tourism, adventure and sports tourism and religious and pilgrimage tourism.
- Timor-Leste has 16 Important Bird Areas (IBAs).

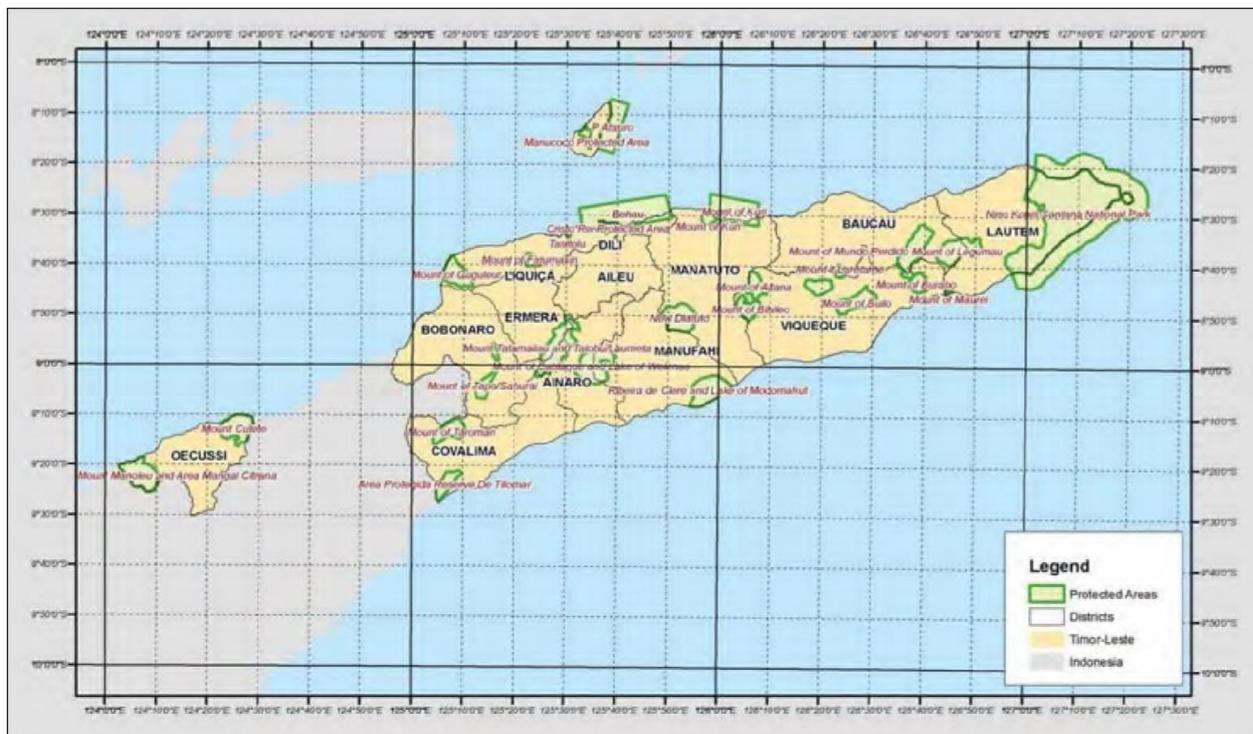
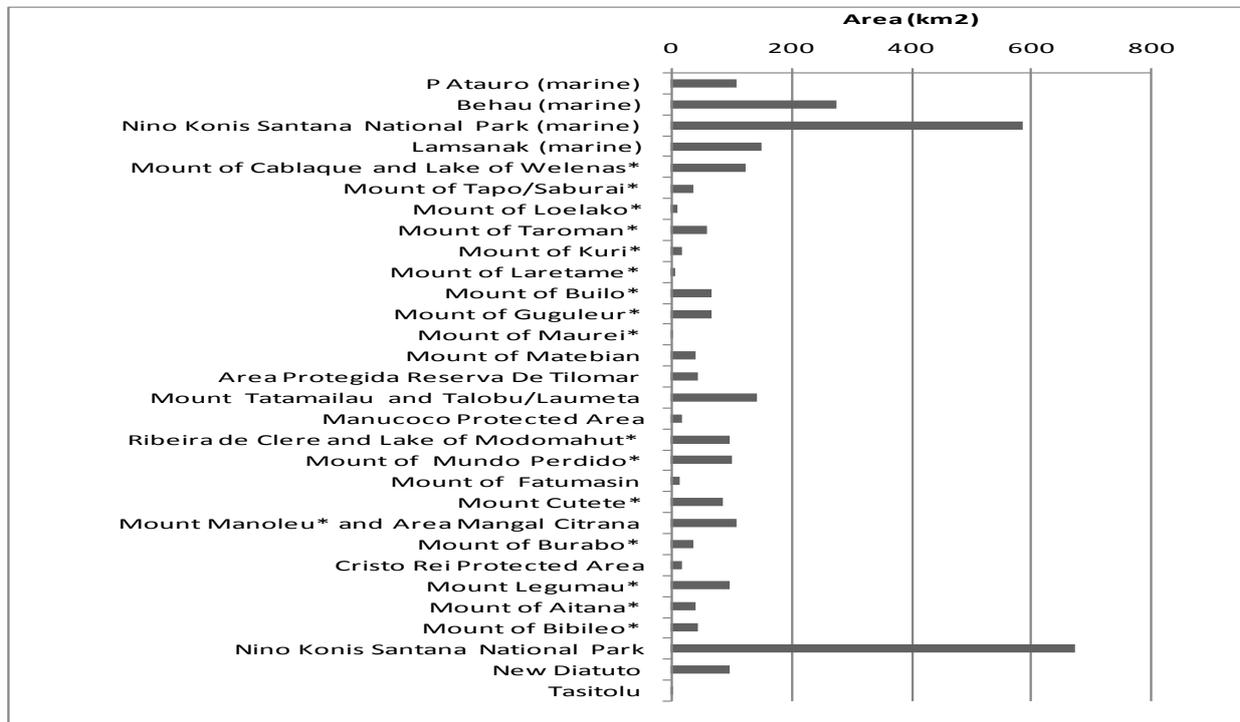


Figure 15. Existing protected and conservation areas in Timor-Leste

The largest protected area in Timor-Leste is Nino Konis Santana National Park (NKSNP) (Figure 22). A part of the NKSNP in the Tutuala section is covered with evergreen forest (Figure 16).



Source: NEGA, 2010

Figure 16. The size distribution of protected area network in Timor-Leste



Evergreen and Karst Forest in Tutuala, a part of NKSNP

The designated protected areas contain the majority of the remaining primary forest cover in Timor-Leste and majority of the areas designated are montane and have high species endemism. Lowland forest areas, typically higher in biodiversity and with greater number of threatened species, are not well represented. Jaco Island and Lake Iralalaru areas have been surveyed by BirdLife International and the Directorate of Environment and are among the first to be proposed as protected areas. Management plans, including management of tourism have yet to be developed for these protected areas.

### **Endemic Bird Area**

Timor-Leste and its associated islands of Wetar, Sawu, Roti and Semau support many unique animal and plant species that are found nowhere else on earth. These islands were defined by BirdLife International as the “Timor and Wetar Endemic Bird Area (EBA)” based on the distribution of restricted-range bird species. It was also reported that a total of 35 restricted-range species occurring in the Timor-Leste and Wetar EBA, of which 31 are found in Timor-Leste (Trainor, *et al.* 2007). Two additional bird taxa, which are endemic to Timor-Leste, have been proposed as full species.

### **Important Bird Area**

An Important Bird Area (IBA) is an area recognized as being a globally important habitat for the conservation of bird populations. The IBA programme aims to identify and protect a network of sites critical for the long-term viability of naturally occurring bird population, across the ranges of bird species of which site-based approaches are appropriate. The following are the different categories of IBAs:

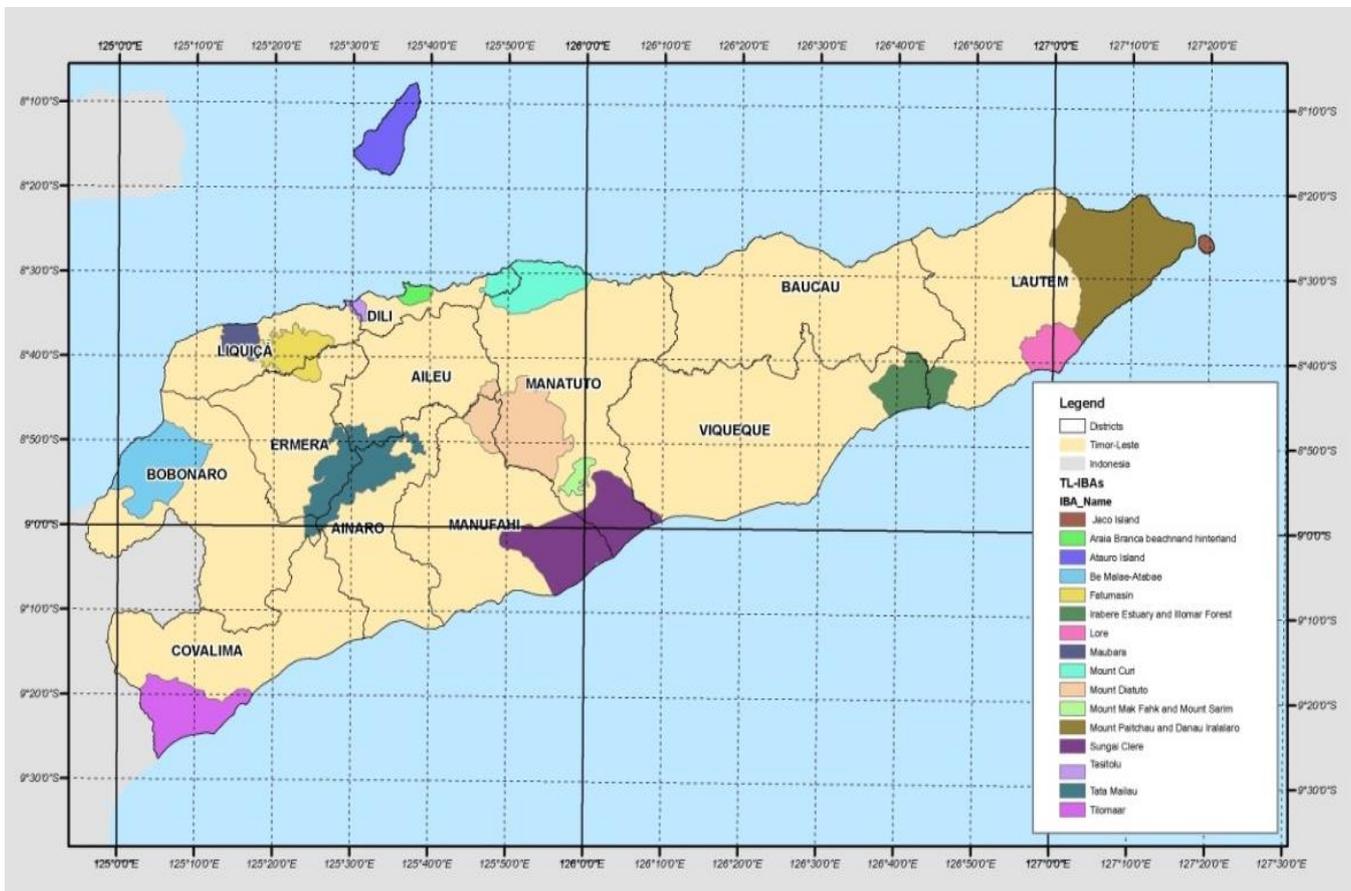
- *Globally threatened species*—the site regularly holds significant numbers of globally threatened species, or other species of globally conservation concern.
- *Restricted range species* —the site is known or thought to hold a significant component of the restricted-range species whose breeding distributions define an EBA or Secondary Area (SA).
- *Biome-restricted assemblages*— the site is known or thought to hold a significant component of the group of species whose breeding distributions are largely or solely confined to one biome.
- *Globally important congregation*—the site is known or thought to hold, on a regular basis, any of the following: a) 21 percent of a biogeographic population of a congregatory waterbird species; b) 21 percent of the global population of a congregatory seabird or terrestrial species; c) 220,000 waterbirds or 210,000 pairs of seabird of one or more species; or d) the site is known or thought to exceed thresholds set for migratory species at bottleneck sites.

There are 16 IBA in Timor-Leste and various assessments have been undertaken at these sites (Table 6). The sites cover a total of 292,629 hectares and are distributed all over the country (Figure 17).

**Table 6. Important Bird Areas in Timor-Leste**

IBA No.	Site	Assessment Undertaken			Area in hectares
		1982 FAO/UNDP	1989 Report	2000 UNTAET	
1	Tilomar	✓	✓	✓	22,708
2	Tata Mailau	✓	✓	✓	20,372
3	Fatumasin	✓	✓	✓	13,616
4	Atauro Island – Manucoco	✓	✓	✓	14,118
5	Sungai Clere	✓	✓	✓	42,266
6	Lore	✓	✓	✓	10,906
7	Monte Paitchao and Lake Iralalaru	✓	✓	✓	55,797
8	Jaco island	✓	✓	✓	1,099
9	Mount Diatuto	✓	✓	✓	34,462
10	Be Malae-Atabae			✓	27,848
11	Maubara			✓	5,292
12	Mount MakFahik and Mount Sarim			✓	2,961
13	Tasitulo			✓	1,540
14	AreiaBranca Beach and Hinterland			✓	2,994
15	Mount Curi			✓	20,086
16	Irabere Estuary and Tilomar forest			✓	16,564

Source: Trainor, et al. 2007



**Figure 17. Important Bird Areas in Timor-Leste**

### **Candidate Sites**

Among the candidate areas for IBA are Saboria Mountain (above 2000 meters); Talubo/Laumeta Mountain (above 2000 meters); Mount Mundo Perdido; Mount Matebian (above 2000 meters); and Mount Cablaque.

There are seven important sites for endemic reptiles and frogs, which include the *Chelodina*, *Cryptoblepharus*, *Cyrtodactylus*, *Eremiascincus*, *Limnonectes*, *Litoria*, and *Sphenomorphus* species; one site for an endemic orchid; one site for an endemic turtle (*Chelodina timorensis*); and one site for an endemic freshwater hardyhead fish (*Craterocephalus laisapi*).

### **A1.2.2 Flora and Fauna**

The flora and fauna are so varied and numerous that every island needs secure protected areas to preserve the country's 2,448 species, which include vertebrates, invertebrates and terrestrial, marine and freshwater plants (Table 7). The total threatened species are 31, distributed as follows: critically endangered (4), endangered (8), and vulnerable (19). The geographic positioning of Timor-Leste places it in a strategic area for marine biodiversity as part of the Coral Triangle. Terrestrial plants, insects, marine mollusks and fishes make up most of the biodiversity in Timor-Leste.

**Table 7. Summary of plant and animal species in Timor-Leste**

<b>Taxa</b>	<b>Number</b>	<b>Threatened</b>
<i>Vertebrates</i>		
Amphibians	10	-
Freshwater fishes	48	1
Marine fishes	264	6
Freshwater and marine fishes	22	-
Terrestrial birds	151	4
Marine birds	16	-
Terrestrial and marine birds	91	3
Terrestrial mammals	69	2
Marine mammals	28	3
Freshwater reptiles	3	-
Terrestrial reptiles	47	-
Marine reptiles	13	6
<i>Invertebrates</i>		
Freshwater molluscs	2	-
Marine molluscs	278	2
Marine crustaceans	39	-
Coelenterates	2	-
Hexacorals	12	-
Insects	488	-
<i>Plants</i>		
Terrestrial	807	4
Marine	28	-
Freshwater	30	-
<b>Total</b>	<b>2,448</b>	<b>31</b>

### **Flora of Timor-Leste**

The natural vegetation is tropical dry broadleaf with an undergrowth of shrubs and grasses supporting a rich wildlife. Many trees are deciduous or partly deciduous, dropping their leaves during the dry season. There are also evergreen and thorn trees in the woodland mix. Typical trees of the lowland slopes include a tropical chestnut, *Sterculia foetida*, *Callophyllum teysmanii* and candlenut (*Aleurites moluccana*). The dominant native species available are *Eucalyptus alba*, *Eucalyptus urophylla*, *Pterocarpus indicus* and *Santalum album*. The most valuable among the native species are *Pterocarpus indicus* and *Santalum album*. A survey conducted by BirdLife International showed that there were more than 251 native tree species and 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*. The main tree species in Timor-Leste are *Eucalyptus alba* and *Casuarina* spp. (Table 8). The list of floral species may be found in Timor-Leste's CHM website. Recent botanical surveys have recorded more than 1,000 plant species, and based upon a comparison with many other Malesian islands, it is predicted that around 2,500 species might occur on Timor Island (Cowie, 2006).

**Table 8. Distribution of main tree species in Timor-Leste**

District	Sandalwood ( <i>Santalum album</i> )	Jati ( <i>Tectona grandis</i> )	Kayu Merah ( <i>Pterocarpus indicus</i> )	Ekaliptus ( <i>Eucalyptus alba</i> )	Sengon ( <i>Albizia falcataria</i> )	Cemara ( <i>Casuarina</i> spp)
Covalima	***	*	***	**	*	***
Almaro	*	*	*	***	**	***
Manufahi	*	***	***	***	**	***
Viqueque	**	***	**	*	*	***
Lautern	***	**	***	-	-	**
Baucau	**	*	**	*	-	-
Manatuto	*	-	**	**	-	***
Dili	-	-	*	***	**	*
Aileu	-	-	-	***	***	*
Liquica	***	*	*	***	**	*
Ermera	-	**	**	***	***	*
Bobonaro	***	*	*	**	**	***
Oecussi	***	**	**	***	-	*

Source: East Timor Agriculture and Virtual Library, 2004.

Legend: \* - under 100 hectares; \*\* - 100 – 500 hectares; \*\*\* - over 500 hectares; - no data

### **New Plant Species**

There are a total of 22 new plant species reported and these are as follows:

Species	Family	Description
<i>Aglaonema aurantifolia</i>	Araceae	Common understory herb found in Malahara and Lore
<i>Aglaia lancilimba</i>	Meliaceae	Tree in semi-evergreen rainforest in Malahara

<i>Alchornea rugosa</i>	Euphorbiaceae	Occasional shrub recorded as understory in dry deciduous forest in Ira Malaro
<i>Alstonia actinopylla</i>	Apocynaceae	Corky-bark tree with milky sap in dry deciduous forest and thorn forest in Ira Malaro
<i>Baumea rubiginosa</i>	Cyperaceae	A robust perennial sedge common in floodplains and grasslands around Lake Iralalaru
<i>Colocasia gigantean</i>	Araceae	Occasional understory herb in the primary forest of Malahara and in the swamp forest in Bauro.
<i>Crateva religiosa</i>	Capparaceae	Tree from the swamp forest in Bauro
<i>Dendrophthoe curvata</i>	Loranthaceae	A mistletoe species from the secondary forest on the upper lake margin
<i>Dimocarpus longan</i> sp. <i>Malesiana</i>	Sapindaceae	Wild progenitor of cultivated longan from semi-evergreen rainforest as an occasional component
<i>Euroschinus falcate</i>	Anacardiaceae	A tree from dry deciduous forest in Ira Malaro and appears to be a rare species in the area
<i>Ficus microcarpa</i>	Moraceae	A fig species found in the swamp forest in Bauro and dry deciduous forest in Ira Malaro
<i>Ficus gul</i>	Moraceae	A fig species from primary semi-evergreen forest in Malahara and from dry deciduous forest in Ira Malaro
<i>Haplolobus floribundus</i>	Burceraceae	Common in semi-evergreen forest in Malahara and in moist deciduous forest in Lore
<i>Homalomena</i> sp.	Araceae	Common understory herb in Lore
<i>Horsfieldia</i> sp.	Myristicaceae	Tree of nutmeg family and an occasional component of the moist deciduous forest in Lore
<i>Hypoxis aurea</i>	Liliaceae	Small perennial herb with yellow flowers produced at ground level. Found on the edge of teak plantations adjoining grasslands in Lore
<i>Myristica lancifolia</i>	Myristicaceae	Tree of nutmeg genus and an occasional component of semi-evergreen forest in Malahara and moist deciduous forest in Lore
<i>Ochrosia oppositifolia</i>	Apocynaceae	Small tree found in strand vegetation in Lore
<i>Pouteria nitida</i>	Sapotaceae	Dominant tree species in semi-evergreen forest in Malahara and also in the lowland rainforest
<i>Pouteria linggensis</i>	Sapotaceae	Large fruited forest tree recorded from swamp forest in Bauro
<i>Polyscias nodosa</i>	Araliaceae	Recorded from primary, semi-evergreen forest in Malahara
<i>Ptychosperma</i> sp.	Arecaceae	Palm species from lowland evergreen rainforest near Mt. Paitchau

Source: Cowie, 2006

### **Fauna of Timor-Leste**

The island fauna, not including birds, is characterized by low overall species richness but with relatively high levels of endemism. At least 262 bird species are known from Timor (Trainor *et al.* 2007). From the 169 species considered resident, 32 are endemic to the Lesser Sundas and

eight are endemic to the Island. At least two mammals (of the 35 native species recorded) and one reptile (of 40 species recorded) are known to be endemic.

Recorded species also include amphibians (10); freshwater (48) and marine (264) and both freshwater and marine (22) fishes; terrestrial (69) and marine (28) mammals; terrestrial (47), marine (13) and freshwater (3) reptiles; marine (278) and freshwater (2) mollusks; marine (39) crustaceans; hexacorals (12); and insects (488). There are only two coelenterates in the country, namely, common mushroom coral (*Fungia fungites*) and Wello fire coral (*Millepora platyphaylla*).

### **Birds of Timor Leste**

Marine and wetland areas throughout Timor-Leste contain a variety of unique water birds. Based on current information, none of these sites have been proven to be large enough to support the numbers of birds required for consideration as IBAs. Freshwater streams provide a valuable source of food such as shrimps and eels. Studies indicate the presence of 151 terrestrial, 16 marine, and 91 terrestrial and marine birds. Threatened and restricted bird species in Timor-Leste include the Christmas Island frigatebird, yellow-crested cockatoo, and Timor figbird (Table 9).

**Table 9. Threatened and restricted-range bird species recorded in Timor-Leste**

English name	Scientific Name	IUCN	EB A	Altitude	Habitat
Christmas island frigatebird	<i>Fregata andresi</i>	CR		Sea level	Marine
Beach-thick knee	<i>Esacus giganteus</i>	NT		Lowlands	Beaches
Malaysian plover	<i>Charadrius peronii</i>	NT		Lowlands	Beaches
Asian dowitcher	<i>Limnodromus semipalmatus</i>	NT		Lowlands	Wetlands
Black-tailed godwit	<i>Limosa limosa</i>	NT		Lowlands	Wetlands
Dusky cuckoo dove	<i>Macropygia magna</i>		RR	0-800	Tropical dry forest
Slaty cuckoo dove	<i>Turacoena modesta</i>	NT	RR	0 – 1100	Tropical dry forest
Wetar ground dove	<i>Gallicolumba hoedtii</i>	EN	RR	0-800	Primary tropical dry forest
Timor green pigeon	<i>Treron psittaceus</i>	EN	RR	0-600	Tropical dry forest
Pink-headed imperial pigeon	<i>Ducula rosacea</i>	NT	RR	0-600	Forest, coastal scrub
Timor imperial pigeon	<i>Ducula cineracea</i>	EN	RR	400–2200	Tropical montane forest
Yellow-crested cockatoo	<i>Cacatua sulphurea</i>	CR		0 – 1000	Tropical dry forest, woodland, plantations
Olive-headed lorikeet	<i>Trichoglossus euteles</i>		RR	0 -2300	Forest, woodland, agricultural land
Iris lorikeet	<i>Psitteuteles iris</i>	NT	RR	0-1500	Closed forest, woodland,

					plantations
Olive-shouldered parrot	<i>Aprosmictus jonquillaceus</i>	NT	RR	0-2600	Tropical dry forest, savanna. Plantations
Cinnamom-banded kingfisher	<i>Todiramphus australasia</i>	NT	RR	0-1300	Evergreen forest, tropical dry forest
Streaky-breasted honeyeater	<i>Meliphaga reticulate</i>		RR	0-1200	Tropical dry forest, villages
Plain friarbird	<i>Philemon inomatus</i>		RR	0-2200	Tropical dry forest
Yellow-eared honeyeater	<i>Lichmera flavicans</i>		RR	0-2000	Tropical dry forest, woodland
Red-rumped myzomela	<i>Myzomela vulnerata</i>		RR	0-1200	Tropical dry forest
Plain gerygone	<i>Gerygone inornata</i>		RR	Lowlands	Tropical dry forest, scrub
Fawn-breasted whistler	<i>Pachycephala orpheus</i>		RR	0-1200	Tropical dry forest
Timor figbird	<i>Sphecotheres viridis</i>		RR	Lowlands	Tropical dry forest, scrub
Olive-brown oriole	<i>Oriolus melanotis</i>		RR	0-1600	Tropical dry forest
Buff-banded grassbird	<i>Buettikoferella bivittata</i>		RR	Lowlands	Tropical dry forest
Timor stubtail	<i>Urosphena subulata</i>		RR	0-1500	Tropical dry forest, scrub
Timor-leaf warbler	<i>Phylloscopus presbytes</i>		RR	0-2300	All forest types
Spot-breasted white-eye	<i>Heleia muelleri</i>	NT	RR	0-1300	Tropical dry forest
Chestnut-backed thrush	<i>Zoothera dohertyi</i>	NT	RR	600-2300	Hill and montane forest
Orange-banded thrush	<i>Zoothera peronii</i>	NT	RR	0-1600	Closed canopy trees, plantations
White-bellied bushchat	<i>Saxicola gutturalis</i>	NT	RR	0-1200	Tropical dry forest, woodlands
Black-banded flycatcher	<i>Ficedula timorensis</i>	NT	RR	0-1200	Evergreen forest, ,tropical dry forest
Timor-blue flycatcher	<i>Cyamis hyacinthinus</i>		RR	0-2000	Tropical dry forest, plantations
Red-crested flowerpecker	<i>Dicaeum maugei</i>		RR	0-1200	Open forest
Flame-breasted sunbird	<i>Nectarinia solaris</i>		RR	0-1000	Tropical dry forest, scrub
Tricolored parrotfinch	<i>Erythrura tricolor</i>		RR	0-1200	Tropical dry forest, thickets

Timor sparrow	<i>Padda fuscata</i>	NT	RR	0-800	Woodland, grassland, agricultural land
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Key: IUCN Red List Status: CR-Critically Endangered; EN – Endangered, NT- Near Threatened  
EBA: RR – Restricted-range species

Source: Trainor, C. R, *et al.* 2007.

### **Endangered and Threatened Species**

According to the IUCN, three tree species, four birds, three mammals and one butterfly in Timor-Leste are considered threatened with extinction generally because of the loss of tropical forest. However, the IUCN assessment is clearly an underestimation as nothing is known about the status of reptiles, amphibians and flora across the island of Timor-Leste, let alone what is endangered in its marine environment. However, a number of plant and animal species have become endangered due to habitat loss, agriculture, fires, resources extraction, logging, harvesting for pet trade and restricted range of species (Table 10). Marine reptiles and terrestrial birds form the majority of critically endangered species in Timor-Leste.

**Table 10. List of endangered plant and animal species in Timor-Leste**

Common Name	Scientific Name	IUCN Status	Threatening Process
<b>Trees</b>			
Sandalwood	<i>Santalum album</i>	VU	Habitat loss, fires, agriculture, extraction
Borneo teak	<i>Intsia bijuga</i>	VU	Habitat loss, selective logging
Burmese rosewood	<i>Pterocarpus indicus</i>	VU	Habitat loss, agriculture, selective logging
	<i>Mangifera timorensis</i>	EN	
<b>Birds</b>			
Timor green pigeon	<i>Treron psittaceus</i>	EN	Habitat loss, agriculture, hunting
Timor imperial pigeon	<i>Ducula cineracea</i>	EN	Habitat loss, agriculture, hunting
Wetar ground dove	<i>Gallicolumba hoedtii</i>	EN	Habitat loss, agriculture, hunting
Yellow-crested cockatoo	<i>Cacatua sulphurea</i>	EN	Habitat loss, harvest for pet trade, agriculture
Slaty cuckoo dove	<i>Turacoena modesta</i>		
Iris lorikeet	<i>Psitteuteles iris</i>		
<b>Mammals and Reptiles</b>			
Thin shrew	<i>Crocidura tenuis</i>	VU	Habitat loss, degradation, restricted range
Western naked-backed bat	<i>Dobsonia peronei</i>	VU	Habitat loss, extraction, restricted range

Mentawai palm civet	<i>Paradoxurus hermaphrodites</i>	VU	
Long-tailed macaque	<i>Macaca fascicularis</i>	LR/nt, CITES	
Northern common cuscus	<i>Phalanger orientalis</i>	CITES	
Timor leaf-nosed bat	<i>Hipposideros crumeniferus</i>	DD	
Greater long-eared bat	<i>Nyctophilus timorensis</i>	VU	
Philippine horseshoe bat	<i>Rhinolophus philippinensis</i>	LR/nt	
Papuan pipistrelle bat	<i>Pipistrellus papuanus</i>	LR/nt	
Schreibers' bent-winged bat	<i>Miniopterus schreibersii</i>	LR/nt	
Timor monitor lizard	<i>Varanus timorensis</i>	CITES	
Estuarine crocodile	<i>Crocodylus porosus</i>	CITES	
Timor python	<i>Python timorensis</i>	CITES	
<b>Insect</b>			
Timor yellow tiger	<i>Parantia timorica</i>	EN	Severely fragmented population with ongoing decline
<b>Marine Species</b>			
Green turtle	<i>Chelonia mydas</i>	EN, CITES	
Hawksbill turtle	<i>Eretmochelys imbricate</i>	CR	
Leatherback turtle	<i>Dermochelys coriacea</i>	CR	
Loggerhead turtle	<i>Caretta caretta</i>	EN	
Olive turtle	<i>Lepidochelys olivacea</i>	EN, CITES	
Dugong	<i>Dugong dugon</i>	VU	
Sperm whale	<i>Physeter catodon</i>	VU	
Killer whale	<i>Orcinus orca</i>	LR/ed, CITES	
Spinner dolphin	<i>Stenella longirostris</i>	LR/ed, CITES	
Bottlenose dolphin	<i>Tursiops truncates</i>	DD	
Basking shark	<i>Rhincodon typus</i>	VU	
Southern giant clam	<i>Tridacna derasa</i>	VU	
Giant clam	<i>Tridacna gigas</i>	VU	
Small giant clam	<i>Tridacna maxima</i>	LR/ed	
Fluted giant clam	<i>Tridacna squamosa</i>	LR/ed	
Bear paw clam	<i>Hippopus hippopus</i>	LR/ed	
China clam	<i>Hippopus porcellanus</i>	LR/ed	
Giant coconut crab	<i>Birgus latro</i>	DD	

CR- critically endangered; EN – endangered; VU – vulnerable; LR – lower risk; (nt – near threatened, ed – conservation dependent), DD- data deficient

Sources: FAA 118/119 Report; Sandlund, *et al.* 2001

### **Invasive Species in Timor-Leste**

Invasion of *Chromolaena odorata* (Siam weed) in agricultural lands, grasslands, land clearing and degraded forests is evident in Timor-Leste and is harmful to both the crops and the animals. Its ability to spread rapidly increases the risk for bush fire.

Other identified and potential invasive species are *Lantana gorse*, *Catharanthus roseus*, *Jatropha gossypifolia*, *Ziziphus mauritiana* and *Calotropis gigantea*.

The Global Invasive Database lists the following invasive species found in Timor Leste: *Chromolaena odorata*, *Leucaena leucocephala*, *Thevetia peruviana*, *Mimosa diplotricha*, *Cyprinus carpio*, *Lutjanus kasmira*, *Gallus gallus*, *Porphyrio porphyrio*, *Cervus timorensis russa*, and *Varanus indicus*. Studies also provide the habitat, geographical range and degree of invasiveness of these species.

## **Annex 2: Biodiversity Policies: Forestry, Coastal and Marine, Water Resources and Climate Change**

### **A2.1 Reforestation Policy and National Forest Policy**

Deforestation is a pressing issue in Timor-Leste and requires public awareness and education in order to instill values on nature protection and conservation to halt the destruction of the environment. For this reason, a Reforestation Policy was created by the Government of Timor-Leste. The policy proposes the establishment of tree nurseries; creation of systems for the prevention of forest soil erosion; and implementation of an orchestrated reforestation programme in all districts, which urges each citizen to plant a tree each year prior to the rainy season.

The Ministry of Agriculture, Forestry and Fisheries or MAF and the NDCF drafted a National Forest Policy aimed at providing a framework for the development of appropriate forest laws and regulations. A concept for implementing participatory forest practices has also been drafted and is under decentralized review. Currently, only four regulations are in effect, two of which were formulated during the UNTAET period: Regulation 2000/17, which prohibits logging and the export of wood products, and Regulation 2000/19, which defines the majority of the remaining forest cover in Timor-Leste as protected areas. The other two regulations are: Resolucao do Governo No. 9/2007, which defines the National Strategy and Policy for Forestry, and Resolucao do Governo No. 8/2007, which established the Nino Konis Santana National Park, the country's first national park.

Timor-Leste's Strategic Development Plan provides the policy directions for forestry. Short-term (2011-2015) policy directions aim to: enhance the technical and managerial capability of forestry officials; enhance the socio-economic conditions of people living around forests; strengthen forest protection and management skills and techniques; and improve forestry data and information management.

Medium-term (2016-2020) policy directions aim to: implement watershed conservation techniques to ensure a more effective protection of water catchment areas; increase participation of civil society or the community in managing the forest; and increase the protection of ecological and biological systems to preserve balance of nature and protect biodiversity.

Long-term (2021-2030) policy direction is geared toward increasing private investments that provide a broader environmental perspective in forest management and utilization.

### **A2.2 Policies on Coastal and Marine Resources Management**

Policies on coastal and marine resources management have yet to be established even with the current National Fisheries Strategy (NFS), which deals with some issues relating to coastal and marine resources.

Implementation of the NFS has had limited progress, partly because of inadequate staff skills and lack of institutional arrangements around the strategy outcomes and challenges as well as political directions from the national level. Specifically, the NFS outlines the need to establish marine protected areas (MPAs) in critical habitats or sites to protect these from unsustainable fishing practices, river-borne pollutants, and coastal building developments. The

NFS, as a policy, recognizes that at the village level, the fisheries sector can contribute to sustainable livelihoods and cash income.

The policy also recognizes the need to use precautionary measures in setting allowable catch limits and providing access to foreign fishing vessels under a license agreement. The fisheries policy has been a work in progress for over six years. Clearly, there is a need to revise this policy and demarcate planning strategies based on the results and analysis of data collected over the years, as well as current information and consultations with the fisheries and other concerned sectors.

The fisheries sector is governed by several policies outlined in the Strategic Policy for the Fisheries Sector and the Fisheries Strategic Plan for 2007/2012. Moreover, based on Timor-Leste's Strategic Development Plan, the short term (2011-2015) policy direction that Timor-Leste is willing to undertake are to: improve fisheries data and information management intended for the provision of fisheries resource database, especially marine fisheries; improve facilities and infrastructure for the protection and preservation of habitats and marine resources; develop or enhance the technical and managerial capacity and skills of fishermen; provide infrastructure and facilities for fishing and aquaculture; improve fisheries production intended for the expansion of and distribution to markets; and support the improvement of fisheries production quality.

The medium-term policy (2016-2020) intends to: support the establishment of financing institutions for fishermen and fish farming communities; develop a mutually beneficial partnership framework intended for strengthening fisherfolks and fishing communities to establish partnership with other entities who are interested in the fisheries sector; develop a fish processing technology to enable a more sustainable fisheries production and to simplify distribution; and standardize fisheries production quality.

The long term policy (2021-2030) intends to: develop a fish processing technology that will support the expansion of the fish processing industry; and increase and expand private investment and participation in the fisheries sector.

### **A2.3 Climate Change Policy**

Timor-Leste is vulnerable to drought due to the annual variability of year-to-year rain events. Lack of water in the northern part of the country is creating severe impact on agriculture and water quality. On the other hand, the southern part of Timor-Leste experiences flooding and two wet seasons every year. Climate change may result in more frequent and intense rain events, which when coupled with existing processes that cause deforestation and soil erosion, could increase or trigger flood damage and landslides. This could alter the local coastal ecosystems. Sea level rise will impact on the infrastructure in and around Dili, the country's capital. It is difficult to predict the impact of climate change on coral reef as there is not enough data on the coverage of live corals and the species composition of the coral reefs. The impacts are likely to be bleaching of corals and increasing rates of coral diseases.

The relatively pristine coastal areas of Timor-Leste suggest that there is natural resilience in the coastal ecosystem to adapt to climate change. However, if the coastal systems are further degraded due to human activities, the level of resilience will decline and result in an altered ecosystem that may no longer be able to support livelihoods at the level required to sustain a healthy population.

Timor Leste's National Adaptation Programme of Action (NAPA) on Climate Change 2010 states that the overarching vision is to make the Timorese people more resilient to climate

change, recognizing their high vulnerability in an economy that is dominated by subsistence agriculture. Adaptation measures will be focused on reducing the adverse effects of climate change and promoting sustainable development. These measures will build on existing strategies and plans across all sectors including the National Priorities process. The proposed priority adaptation measures are:

- *Food security*: Reduction of vulnerability of farmers and pastoralists to drought and flood events;
- *Water resources*: Promotion of Integrated Water Resource Management (IWRM) to guarantee water access in a climate change context;
- *Human Health*: Enhancement of capacity of the health sector and communities to anticipate and respond to changes in the distribution of endemic and epidemic climate-sensitive diseases, and reduction of vulnerability of the population to infection in areas at risk from increasing climate-related diseases;
- *Natural Disasters*: Improvement of institutional and community (including vulnerable groups such as women and children) capacity to prepare for and respond to climate change-induced natural disasters;
- *Forests, Biodiversity and Coastal Ecosystems*: Maintenance and restoration of mangroves and forests and promotion of public awareness to protect coastal ecosystems and forests from climate change impacts;
- *Livestock Production*: Improvement of planning and the legal framework for promoting sustainable and balanced food for livestock production;
- *Physical Infrastructure*: Improvement of regulations, standards and compliance for climate-resilient infrastructure;
- *Poverty Reduction*: Support to the national poverty reduction target in relation to the expected increase of storm intensity at sea, by improving capacity to forecast and adapt offshore oil and gas infrastructure to withstand strong storms and waves;
- A ninth priority area, underpinning all others, focuses on *National Institutional Capacity Development for Climate Change* through which overarching programme level coherence will be ensured.

The Government of Timor-Leste gives importance to global climate change and its effects on the country. Timor-Leste's geographic position makes it vulnerable to disasters that may greatly affect its social and economic infrastructure and the lives of the people. Thus, the National Disaster Management Directorate adopted the National Disaster Risk Management Policy, which covers a shift from traditional crisis response management to disaster, conflict and climate change risk reduction. The policy provides a general framework and activities for disaster risk management and the integration of activities across all sectors that address economic, social and environmental development, strengthen community capacity and reduce vulnerabilities.

Policies and institutional arrangements are being established in the area of climate change adaptation. The Ministry of Economy and Development, through the National Directorate for Environmental Services and the National Directorate for International Environment Affairs, submitted the first Initial National Communication in 2008 and established several thematic working groups to oversee climate change planning.

## A2.4 Water Resources Policy

For the water sector, a National Water Policy has been formulated but not yet approved. The policy incorporates the key principles of integrated water resources management. Under the Strategic Development Plan, the framework and policy direction for the development of the country's water resources must be done gradually.

Short-term approaches include: formulating policy on nature conservation to preserve water cycle balance, and protecting the hydrology cycle to safeguard nature conservation balance, especially the conservation of forest, river, watershed, sea, and coastal areas. The middle-term strategies include utilizing water resources to fulfill the society's demand for water and energy, and exploiting water resources with the appropriate technology. In the long term, Timor-Leste aims to reduce dependency on diesel-generated power by using hydropower.

The main water resources management strategy is to tap both the surface water and soil water, while managing the impact of water run-off. This will be done by conducting a review study of the capacity and quality of all potential water resources; improving existing water construction so that they could optimally function; using technology related to the utilization of water resources management; and discovering alternative water sources.

## A2.5 Biodiversity-related national laws and regulations

National Laws and Regulations	
<b>UNTAET Regulation No. 2000/17</b> - On the prohibition of logging operations and the export of wood from Timor-Leste	<b>Section 2.</b> Logging operations in Timor-Leste; the export from Timor-Leste of wood in any form, including logs, planks, plywood or furniture; and the burning of forests and other destructive activities are prohibited.
	<b>Section 3.1.</b> Any person or legal entity wishing to conduct logging operations; or export wood in any form from Timor-Leste for use by the pharmaceutical industry, the cosmetics industry or for such other purposes and upon conditions as deemed essential by UNTAET for the economy of East Timor, authorized by an UNTAET directive, may apply to the UNTAET Agricultural Affairs Unit for an exemption from the prohibition stated in Section 2 of the present Regulation.
	<b>Section 3.2.</b> The application form for an exemption shall be prescribed by an UNTAET directive.
	<b>Section 3.3.</b> Unless decided otherwise by the Transitional Administrator, Section 2(a) shall not apply to logging operations for the purpose of producing wood for traditional farming and other domestic, traditional or cultural uses; construction of traditional houses; and construction of religious buildings in Timor-Leste, on land that is below 1,500 meters asl and slopes of less than 25 percent.
	<b>Section 3.4.</b> Section 2(b) shall not apply to wood used locally to make handicrafts and exported by individuals as part of personal household effects or luggage.
	<b>Section 3.5.</b> The granting of exemption may be subject to conditions.
<b>UNTAET Regulation</b>	<b>Section 2.</b> Protected Wild Areas

<p><b>No. 2000/19</b> on Protected Wild Areas</p>	<p><b>Section 2.1</b> Under the present regulation, “protected wild areas” shall mean areas of land constituting islands, beaches, mountains, sanctuaries, reserves and other areas.</p> <p><b>Section 2.2.</b> In addition to specified protected wild areas under Section 2.1, the Transitional Administrator may designate a directive for other terrestrial or marine areas of exceptional importance for their scenic and natural qualities; for their biological resources including rare or threatened animals and plants; or as habitats of endangered species.</p> <p><b>Section 2.3.</b> Protected wild areas shall be managed in order to maintain and enhance their wild and natural character and to preserve endemic animals and plants within the protected wild area. Subject to Section 2.4 of the present regulation, within a protected wild area, the erection of a temporary or permanent structure of any form; the building of a road or other access place for vehicles and transportation; the hunting, trapping, taking or disturbing of animals; the taking or disturbing of plant life; the use of a protected wild area for agricultural purposes and the grazing of animals; and the pollution of a protected wild area shall be prohibited.</p> <p><b>Section 2.4.</b> The following activities conducted in accordance with local law and tradition by local communities living close to the area, specified under Section 2.1 may be permitted: the harvesting of non-forest products; the selective grazing of animals; the use of non-endangered animals and plants for religious and cultural ceremonies; the traditional hunting of non-endangered species; the traditional cutting of trees at elevation below 2,000 meters in places other than Jaco Island, provided such cutting and transport of wood within the protected wild areas is done in a sustainable manner and without use of machinery; and any other traditional purpose consistent with the intent of the present regulation.</p>
<p><b>Resolucao do Governo (Government Regulation) No. 8/2007</b> on the creation of Nino Konis Santana National Park (terrestrial and marine)</p>	<p>Nino Konis Santana National Park is the largest among the declared protected areas. The Park covers an area of 123,600 ha (68,000 ha on land and 55,600 ha on sea).</p>
<p><b>Resolucao do Governo (Government Regulation) No. 9/2007</b> on the National Forestry Strategy and Policy</p>	<p>The objectives of this Regulation are for forest protection, water conservation and land restoration. The key strategy is to protect all forests from damage or loss through programs that will empower, encourage and involve communities to manage forest lands, through public awareness and education activities, the prevention and physical control of wild fires, and reduced livestock grazing.</p>

## A2.6 Description of Relevant Sector Plans and Strategies

National Policies, Plans and Programmes	
<p><b><i>Strategic Development Plan for Forestry</i></b></p>	<p>As provided for in Timor-Leste’s Strategic Development Plan, the policy directions for forestry are the following:</p> <p><u>Short term (2011-2015)</u></p> <ul style="list-style-type: none"> <li>• Improve technical and managerial capability of forestry officials</li> <li>• Enhance or improve the socio-economic conditions of people living around the forests</li> <li>• Strengthen forest protection to provide safeguards for forest resources from illegal logging, forest fires and area destruction</li> <li>• Improve forestry data and information management</li> </ul> <p><u>Medium Term (2016-2020)</u></p> <ul style="list-style-type: none"> <li>• Conduct watershed conservation to provide protection of water catchment areas</li> <li>• Increase protection of the ecological and biological system to preserve balance of nature and protection of biodiversity</li> </ul> <p><u>Long Term (2021-2030)</u></p> <ul style="list-style-type: none"> <li>• Increase private investment by employing environmental perspective for forest management</li> </ul>
<p><b><i>National Ecological Gap Assessment (NEGA) Medium-Term 2020 Targets for Protected Area Network</i></b></p>	<p><i>Goal 1.</i> Ensure full representation across biological scales and biological realms</p> <ul style="list-style-type: none"> <li>• Ensure a minimum of 30 percent of the original extent for each major vegetation type in protected areas</li> <li>• Ensure a minimum of 50 percent of the current extent of estuaries</li> <li>• Ensure a minimum of 30 percent distribution of each known taxa in protected areas</li> </ul> <p><i>Goal 2.</i> Protect all critical habitats for endemic, migratory and threatened species</p> <ul style="list-style-type: none"> <li>• Capture 100 percent of the critical habitat for terrestrial threatened species and 50 percent of critical habitat for marine threatened species in protected areas</li> <li>• Where possible, provide 100 percent protection for fish spawning areas and at least 80 percent of mangroves as fish nurseries</li> <li>• Capture 100 percent of the known range of terrestrial</li> </ul>

	<p>migratory species and 50 percent of the known range of marine migratory species in protected areas</p> <p><i>Goal 3.</i> Ensure that protected areas are of the right size for the persistence of biodiversity</p> <ul style="list-style-type: none"> <li>Minimize fragmentation of protected area boundaries and maximize habitat connectivity between protected areas to maintain/restore 100 percent habitat connectivity within and around terrestrial protected areas and 50 percent of marine protected areas.</li> </ul> <p><i>Goal 4.</i> Ensure that protected areas play a role in mitigating climate change</p> <ul style="list-style-type: none"> <li>Ensure that 30 percent of the nation’s sequestered carbon found in living terrestrial vegetation is captured inside protected areas; and for mangrove forests, with 80 percent to be protected in protected areas.</li> </ul> <p><i>Goal 5.</i> Design protected areas so that they are resilient and able to withstand stresses and changes such as human-caused climate change</p> <ul style="list-style-type: none"> <li>Where possible, ensure that protected areas are as large as they can possibly be</li> <li>Where possible, ensure that protected areas connect with other protected areas, especially along elevation gradients for terrestrial protected areas</li> <li>Where possible, and where there are good areas that represent major geological features in the protected area system, protect climate refugia.</li> </ul>
<p><b><i>National Action Plan (NAP) to Combat Land Degradation</i></b></p>	<p><i>Goal:</i> Ensure the sustainable management of agricultural, forest and other terrestrial lands of Timor-Leste to contribute positively to the environmental, economic and social well-being of the nation.</p> <p><i>Objectives:</i> Lay out priority actions towards controlling factors that contribute to and mitigate the effects of land degradation in Timor-Leste in an integrated manner and as a prerequisite for the sustainable livelihoods of the people.</p> <p><i>Long Term NAP Objectives</i></p> <p><i>For the environment</i></p> <ul style="list-style-type: none"> <li>Effective implementation of sustainable agriculture and forestry through provision of effective incentive and regulation</li> <li>Effective water resource management</li> </ul>

	<ul style="list-style-type: none"> <li>• Expansion in woodland areas to achieve biodiversity conservation and increase carbon storage capacity to help tackle global warming</li> <li>• Sustainable management of the land to maintain its local landscape character and responsive to ecosystem requirements</li> <li>• Restoration of damaged lands and good management of soils, to reduce soil compaction and erosion</li> </ul> <p><i>For the economy</i></p> <ul style="list-style-type: none"> <li>• Prosperous agriculture and forestry that provide for the nation's food security and improved nutrition</li> <li>• Self-reliant rural communities through improved productivity, increased income and employment opportunities</li> <li>• Sufficient economic returns of crops to cover investment in sustainable land management</li> </ul> <p><i>For the people</i></p> <ul style="list-style-type: none"> <li>• Good understanding of the implications of taking gender issues into consideration in order to combat land degradation</li> <li>• Better understanding of sustainable land management and its importance to rural economy</li> <li>• Improved quality of life through better environment, availability of high quality, locally produced food and improved access to clean and abundant water</li> </ul> <p><i>Priority Programmes and Actions</i></p> <ul style="list-style-type: none"> <li>• Land degradation prevention: sustainable agriculture and forestry development, poverty alleviation programmes, public education and awareness, and improvement of legislative framework and policies for sustainable land management</li> <li>• Land degradation mitigation: land degradation inventory and monitoring, rehabilitation of degraded lands and protection of water resources, and monitoring and mitigating the impact of climate variability</li> </ul> <p><i>Project Concepts</i></p> <ul style="list-style-type: none"> <li>• Capacity building for sustainable land-use planning and management</li> <li>• Local capacity development for sustainable upland farming</li> <li>• Establishment of legislative and policy framework for sustainable land management</li> </ul>
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	<ul style="list-style-type: none"> <li>• Rural renewable energy development</li> </ul>
<b>National Fisheries Strategy</b>	<p>The National Fisheries Strategy outlines the need to establish Marine Protected Areas (MPAs) over critical habitats to protect these from unsustainable fishing practices, damage to terrestrial ecosystems, river-borne pollution and coastal building developments. The Fisheries Code and the Fisheries Law are in place and being enforced in the country. However, there is a need to revise these policies based on current information and consultations. Based on Timor-Leste’s Strategic Development Plan, the policy directions for fisheries are as follows:</p> <p><i>Short term (2011-2015)</i></p> <ul style="list-style-type: none"> <li>• Improve fisheries data and information management intended for the provision of fisheries resource database, especially for marine fisheries</li> <li>• Improve facilities and infrastructure for the protection of the seas to preserve marine resources</li> <li>• Develop the capacity of fishermen and farmers to enhance skills, and provide infrastructure and facilities for fishing and aquaculture</li> <li>• Increase and improve technical and managerial capability of human resources on fisheries apparatus</li> <li>• Improve distribution of fisheries production intended for the expansion of fisheries production marketing, and support the enhancement of fisheries production quality</li> </ul> <p><i>Medium term (2016-2020)</i></p> <ul style="list-style-type: none"> <li>• Support the creation of financial institution for fisherfolks and fish farming communities to provide financing access</li> <li>• Develop mutually beneficial partnership framework for fisherfolks and fish farming communities with other entities that are interested in the fisheries sector</li> <li>• Develop fish processing technology that ensures a more sustainable fisheries production and to simplify distribution</li> <li>• Standardize fisheries production quality</li> </ul> <p><i>Long term (2021-2030)</i></p> <ul style="list-style-type: none"> <li>• Develop fish processing technology to support the expansion of the fish processing industry</li> <li>• Increase private investment and participation in the fisheries sector</li> </ul>
<b>National Adaptation Programme of Action</b>	<p>The following priority adaptation measures are proposed for Timor-Leste:</p>

**(NAPA) on Climate Change 2010**

- *Food security:* Reduce vulnerability of farmers and pastoralists to drought and flood events
- *Water resources:* Promote Integrated Water Resource Management (IWRM) to guarantee water access in a climate change context
- *Human health:* Enhance the capacity of the health sector and communities to anticipate and respond to changes in the distribution of endemic and epidemic climate-sensitive diseases and reduce the vulnerability of the population to infection in areas at risk of climate-related diseases
- *Natural disasters:* Improve institutional and community (including vulnerable groups such as women and children) capacity to prepare for and respond to climate change-induced natural disasters
- *Forests, biodiversity and coastal ecosystems:* Maintain and restore mangrove and forests and promote awareness raising to protect coastal ecosystems and forests from climate change impacts
- *Livestock production:* Improve planning and legal framework for promoting sustainable and balanced food for livestock production
- *Physical infrastructure:* Improve regulations, standards and compliance for climate-resilient infrastructure
- *Poverty reduction:* Support the national poverty reduction target in relation to the expected increased storm intensity at sea by improving capacity to forecast and adapt offshore oil and gas infrastructure to withstand strong storms and waves.
- *Ninth priority area:* Underpinning all others, the focus is on national institutional capacity development for Climate Change through which overarching programme level coherence will be ensured

### Annex 3. revised: NBSAP Strategic Actions identified for Timor-Leste

Strategic actions of Timor-Leste are divided between priority actions and further actions; priority actions are earmarked by black bold fonts, for further actions normal black fonts are used. Integral numbers and text in blue italics refer to strategic action groups; decimal numbers refer to sub-actions under the strategic action groups, PS=priority strategy – highlighted in bold blue

#	Strategic actions and sub-actions	Timelines	
		2012-2015	2016-2020
	<b>PS 1 - Mainstreaming biodiversity into sectoral plans and programmes to address the underlying causes of biodiversity loss</b>		
1	<i>Raise awareness on the values of biodiversity and engage various sectors including the media, business sector, youth and women groups and local communities in conservation activities:</i>		
1.1	<b>Conduct communication, education and public awareness activities through forum, seminars and public dialogues on environment and biodiversity conservation especially on various topics such as sustainable management of ecosystems; endangered species and prohibition of collection and sale; pollution and garbage; wildlife management and conservation; sound management of land, forest and water resources; and other related topics.</b>	■	■
1.2	<b>Produce and distribute CEPA publications such as brochures, pamphlets, newsletters and other printed materials, and participate in exhibits in village and school activities.</b>	■	■
1.3	<b>Establish a Communication and Education and Information Centre and Library.</b>	■	
1.4	<b>Develop modules on environment and biodiversity conservation for integration in the elementary and high school curriculum.</b>	■	■
1.5	Design and implement education modules for specific grade levels in the elementary and high school, on coastal ecosystems and their management, focusing on habitat-building species such as mangroves, coral reefs and sea grasses. This will be implemented in cooperation with the education agency and the schools/universities.		■
1.6	Mobilize environmental education for environment and biodiversity conservation at the community level through community-level environmental education campaigns, regular dialogues and involvement of local communities in conservation and income-generating activities. This should include coordination with local elders so that the conservation agenda is included in the traditional Tara Bandu.	■	■
1.7	Integrate the principles of sustainable land management at all levels of formal education.		■

1.8	Develop and implement a technical and vocational education and training plan for Timorese especially the out-of-school youth through development of national curricula for identified/registered training courses.	■	■
1.9	Establish a marine research and development and demonstration center.		■
1.10	Promote improved and sustained conservation of threatened species through public awareness.	■	■
1.11	Develop an information and wise use campaign directed at educating stakeholders on best practices in sewage and solid waste management, forest fire prevention and other environmental issues; encourage composting, plastic, glass and paper recycling.	■	■
1.12	Launch information campaign on climate change mitigation and adaptation especially for local communities.	■	■
1.13	Conduct information campaign in communities and schools on the restoration and safeguarding of our ecosystems.	■	■
1.14	Involve the local constituency in environmental/conservation planning and management through public consultation.	■	■
2	<i>Mainstream sectoral plans, policies, and national planning</i>		
2.1	<b>Develop policies and programmes to integrate biodiversity into agriculture programmes and promote agro-biodiversity.</b>	■	■
2.2	<b>Introduce and promote appropriate and environmentally-compatible improved farming practices to increase production in agricultural lands, e.g. alley cropping, crop rotation, terracing, high-yield seeds.</b>	■	■
2.3	Integrate urban planning strategies, land use and protected area plans into the national planning systems.	■	
2.4	Integrate tourism and ecotourism in the Forestry and Protected Area Management Plan.		■
2.5	Integrate environmental considerations in policies and legislations in the industrial, tourism, agriculture, forestry and fisheries sectors.		■
2.6	Mainstream conservation and maximize benefits for natural habitats in infrastructure projects.		■
3	<i>Promote nature-based and community-based sustainable tourism and ecotourism:</i>		
3.1	<b>Review and develop national and local laws and policies on tourism and ecotourism.</b>	■	
3.2	<b>Establish and develop key tourism destinations and ecotourism centers with upgraded infrastructures and promotional materials that integrate biodiversity.</b>		■
3.3	Determine potentials for ecotourism as an incentive to forest and biodiversity and involve the local communities in the development of a tourism/ecotourism plan and implementation of tourism activities, especially for the sites that are sacred to them.		■
3.4	Conduct inventory of tourism/ecotourism attractions in Timor-Leste: eco- and marine tourism; historic and cultural tourism; adventure and sports tourism; religious pilgrimage; and conference and convention tourism.	■	

3.5	Support the development of environment-friendly tourism or ecotourism.	■	
3.6	Develop tourism promotion marketing strategies.	■	
3.7	Join forces with private sector for the development of tourism infrastructures.	■	
3.8	Develop comprehensive tourism packages.	■	
3.9	Establish Tourist Information Centers.	■	
3.10	Involve community groups in tourism/ecotourism services: taxis, restaurants, guesthouses, and IT services (internet, cell phones, etc.).	■	■
3.11	Create a multi-sectoral tourism board to facilitate the planning and management of the ecotourism industry in protected areas.		■
4	<i>Develop and enforce a sustainable land management and land use policy:</i>		
4.1	<b>Socialize and implement sustainable land management and land use policy.</b>	■	
4.2	<b>Monitor impacts of sustainable land management and land use policy.</b>	■	
4.3	<b>Enhance sustainable land management and land use policy.</b>		■
4.4	Improve legislative framework and policies for sustainable land management.	■	
4.5	Ensure an improved land-use classification and delineation.	■	
4.6	Establish systems of formal land administration and regulatory arrangements for proper land use and management.		■
5	<i>Ensure impact assessment of development projects through the Environmental Impact Assessment (EIA) system:</i>		
5.1	<b>Enhance implementation of the EIA system (National Decree No. 5/Feb 2011) for specific development projects</b>	■	■
5.2	<b>Implement appropriate EIA system and evaluate impacts of development projects (industry, oil and mining, infrastructure, energy, transport, etc.)</b>	■	■
5.3	Investigate and determine possible impacts of exploration and other development projects to ensure that proper mitigation methods are employed.		■
5.4	Develop policies regarding responsible assessment of the environmental impacts and implementation of investment projects.	■	■
	<b>PS 2 - Protecting biodiversity and promoting sustainable use</b>		
6	<i>Enhance and develop a national biodiversity law and relevant environmental policies on nature conservation, pollution and other related concerns, including traditional laws:</i>		
6.1	<b>Conduct inclusive stakeholder consultation/socialization of the national Biodiversity Law/Decree and Wildlife Conservation Law.</b>	■	
6.2	<b>Facilitate enactment and implementation of the National Biodiversity Law, including wildlife conservation policies and benefits sharing.</b>	■	
6.3	<b>Strictly implement environmental decrees, regulations and policies at national and district levels, including traditional laws (Tara Bandu).</b>	■	■

6.4	Review existing laws, policies and regulations on environmental protection and natural resources conservation, evaluate their effectiveness, amend and/or develop appropriate laws and regulations, and support the conservation of forests and other ecosystems using both the national legislation and the traditional law enforcement systems (Tara Bandu).	■	
6.5	Review, revise and enhance existing and/or formulate new and appropriate forestry laws and regulations to ensure effective management of forests.	■	■
6.6	Enforce and implement forestry, environmental and biodiversity laws and regulations.	■	■
6.7	Improve and/or formulate appropriate laws and regulations regarding waste management and control of air, water, soil, and noise pollution and emissions from vehicles; and penalties/fines for polluters for the damage caused by their action.		■
6.8	Ratify and have access to international treaties on environment such as the Ramsar Convention on Wetlands, CITES Convention and other conventions. In addition to the benefits accruing from the policy side of these conventions, countries that are parties to the conventions have access to several international funding sources.	■	■
6.9	Advocate for and promote the development of locally relevant natural resource management policies; provide assistance in developing transparent, appropriate, practical and understandable laws, regulations and procedures.	■	■
6.10	Monitor and evaluate implemented laws and regulations. Results will serve as basis for enhancement or revision.	■	■
6.11	Document and share best practices and lessons learned related to the implementation of laws and regulations.	■	■
7	<i>Rehabilitate damaged and critical habitats and ecosystems and degraded watersheds through massive tree planting including mangrove reforestation:</i>		
7.1	<b>Establish community-based nurseries especially for high-value timber trees and involve local communities in reforestation/planting activities.</b>	■	■
7.2	<b>Conduct massive tree planting activities by targeting one million trees nationwide every year, and reforest degraded mangrove areas.</b>	■	■
7.3	<b>Assess and identify areas suitable for planting (e.g., degraded mountain slopes and watersheds) and identify appropriate rehabilitation approaches and suitable species for planting (e.g., suitable tree species include trees for domestic and commercial use and for environmental rehabilitation).</b>	■	■
7.4	<b>Develop and implement a monitoring and evaluation system for rehabilitation activities (to monitor growth and survival and replanting needs).</b>	■	■
7.5	Plant trees along riverbanks, roadsides, steep slopes and lake margins to prevent soil erosion.	■	■
7.6	Plant native tree species in favour of introduced species to restore natural habitats of associated insects and other organisms.	■	■

7.7	Conserve mother trees for seed production.	■	■
7.8	Develop and implement a Forestry Management Plan, integrating tourism in it.	■	■
7.9	Restore/rehabilitate degraded landscapes and habitats using native species and diverse planting.	■	■
7.10	Encourage communities to spearhead tree planting activities in forests and protected areas.	■	■
7.11	Conduct enrichment planting in sparse forests and upland farms, to help increase carbon stocks.	■	■
8	<i>Assess impacts of invasive species and prevent and control their spread:</i>		
8.1	<b>Identify invasive species and pathways in critical sites and assess their impacts on ecosystems and biodiversity.</b>	■	■
8.2	<b>Identify and implement prevention, control or eradication measures on invasive species.</b>	■	■
8.3	Document and disseminate available best practices for the proper management of invasive species.	■	■
9	<i>Implement sustainable livelihood activities for local communities, promote traditional conservation knowledge and practices, and enhance the role of women and youth in biodiversity conservation:</i>		
9.1	<b>Organize and mobilize communities to protect and manage forests and other ecosystems.</b>	■	
9.2	<b>Sensitize communities and let them understand the importance and values and functioning of ecosystems and biodiversity resources therein.</b>	■	
9.3	<b>Develop pilot sites to mobilize communities to protect and manage forests.</b>		■
9.4	<b>Enhance existing and develop new sustainable livelihood options for local communities.</b>	■	
9.5	Identify and develop livelihood opportunities: Production of seedlings of high-value forest species; fruit trees and other agricultural crops for sale; Handicraft using dried branches and twigs; Manufacture of household products such as brooms, baskets and cooking implements Household industries like carpentry and furniture making	■	■
9.6	Support community-based tree and forest product enterprises that provide local communities some benefits from forest resources.		■
	<b>PS 3 - Building climate resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity</b>		
10	<i>Effectively manage representative samples of biodiversity in the 52 identified protected areas and create natural conservation zones to protect specific biodiversity and ecosystems:</i>		
10.1	<b>Delineate and map protected areas and identified conservation areas including lands occupied by local people.</b>	■	
10.2	<b>Assess flora and fauna and identify endangered and threatened species, together with the direct and indirect causes of threat.</b>	■	

10.3	<b>Identify and develop protection programmes for endangered species in all ecosystems (forests, mountains, inland wetlands, coastal and marine areas, agricultural lands, etc.), including commercially and culturally valuable species.</b>	■	
10.4	<b>Prepare and implement a management plan for each protected area integrating climate change, connectivity, promotion of equity and benefit-sharing, as well as standards for the preparation and approval, and establish effective management systems for the terrestrial and marine protected area network.</b>	■	
10.5	<b>Establish multi-stakeholder Protected Area Management authorities for each of the 52 identified sites, composed of government, district authorities and local community representatives.</b>		■
10.6	<b>Establish in-situ and ex-situ conservation approaches/pilot sites/facilities to conserve specific endangered plant or animal species.</b>		■
10.7	<b>Establish wildlife rescue and refuge centers.</b>		■
10.8	Identify and conduct a survey and detailed mapping of biodiversity-rich areas.	■	
10.9	Designate and conserve areas with unique value, natural beauty and cultural significance.		■
10.10	Review, revise and enhance existing and/or formulate new protected area laws and regulations, including traditional laws, to ensure the effective management of protected and other conservation areas.	■	■
10.11	Encourage community support to the conservation and management of protected areas and conservation areas through socialization (community-level environmental education campaigns) coupled with environment-appropriate income-generating livelihoods especially for those living within and around the area.	■	■
10.12	Promote effective management of protected areas through public awareness, the development and dissemination of comprehensive field guides and best practices, and attendance at regional and international convention meetings.	■	■
10.13	Review protected area categories and integrated management and identify opportunities to strengthen the protected area system by developing transfrontier collaboration.		■
10.14	Implement the CBD Programme of Work on Protected Areas (POWPA) as the global standard for the comprehensive and effective management of protected areas.		■
10.15	Maintain connectivity across landscapes by reducing fragmentation, recovering lost habitats, expanding protected area networks and establishing ecological corridors.		■
10.16	Establish routine monitoring of biodiversity impacts and management effectiveness in protected areas as well as socio-economic conditions of local communities by developing a harmonized reporting system and meeting international reporting obligations to CBD and other international conventions.	■	■
10.17	Establish databases for protected areas and for a network of experts in the country.	■	■

10.18	Recover/re-introduce rare and endangered species.	■	■
10.19	Prioritize conservation of forests of high biodiversity and large areas of primary intact forests.	■	■
10.20	Develop pilot demonstration and/or plantation areas for threatened tree species.		■
10.21	Conserve diversity of forest types.	■	■
10.22	Develop guidelines and apply best practices for sustainable forest management.		■
11	<i>Develop and implement a comprehensive and integrated coastal and marine and fisheries management programme and promote responsible and sustainable coastal and marine resources use:</i>		
11.1	<b>Develop a comprehensive and integrated marine and coastal policy and fisheries management system.</b>		■
11.2	<b>Establish and implement Integrated Coastal Management (ICM) programmes focusing on sustainable livelihood development, including sustainable fishery management.</b>		■
11.3	<b>Enhance fishery production quality and improve distribution of fisheries production, including developing fisheries production quality standards.</b>		■
11.4	<b>Support the creation of financial institutions for fishermen and fish farming communities.</b>		■
11.5	<b>Develop fish processing technology and establish fish processing plants.</b>		■
11.6	Make an inventory and assessment of sites for commercial fishing.	■	■
11.7	Protect water resources and conserve aquatic biodiversity.	■	■
11.8	Increase conservation and protection of habitat, sea grass and breeding grounds, especially those areas with the highest marine biodiversity and with high number of endemic species per unit area and those areas with moderate biodiversity values but with substantial natural habitats under threats.	■	■
11.9	Conduct reforestation activities/projects in selected mangrove sites as prioritized and guided by appropriate technologies (species selection, species-soil compatibility).	■	■
11.10	Design and implement a community-based mangrove management (reforestation and conservation) strategy, including policy support.	■	■
11.11	Conduct clean-up activities such as clean-up of coastal areas and wetlands.	■	■
11.12	Regulate and monitor expansion and/or intensification activities in aquaculture to minimize if not prevent destruction of mangrove and pollution of coastal areas in many parts of the country.	■	■
11.13	Identify species and distribution of coral reefs.	■	■
11.14	Determine status and extent of damage to coral reefs, if any.	■	■
11.15	Identify and implement approaches to rehabilitate and/or enhance coral reefs.	■	■
12	<i>Develop and implement a comprehensive and integrated agricultural management programme aimed at maintaining plant genetic diversity:</i>		

12.1	<b>Diversify types of products and develop alternatives to subsistence agriculture through the Seeds of Life Programme.</b>	■	
12.2	<b>Employ techniques such as the Integrated Pest Management (IPM); Integrated Crop Management (ICM); and System of Rice Identification (SRI).</b>	■	
12.3	<b>Establish gene banks to ensure sustainable supply of seeds.</b>		■
12.4	<b>Establish an animal laboratory and medical center.</b>		■
12.5	Identify agricultural zones suitable for specific crop production.	■	
12.6	Establish farm grain storage and improve post-harvest facilities and technologies and the use of resistant varieties to cope with post harvest rot and to stop the spread of fungi; establish demonstration plot for fodder and livestock waste processing for organic fertilizer.	■	■
12.7	Rehabilitate and extend irrigation systems and improve water quality and storage; promote farm modernization for water security.	■	■
12.8	Establish on-farm agro-biodiversity conservation centers.		■
12.9	Promote agroforestry activities and techniques, e.g. in coffee plantations, to increase tree cover, provide income, improve food security, and control erosion.	■	■
12.10	Invest in and support research, development and extension programmes for agriculture, including market research.	■	■
12.11	Promote organic farming.		
12.12	Use appropriate seeds, fertilizers and pesticides.	■	■
12.13	Introduce and adopt quality standard grades for important agricultural crops like coffee and coconut.		■
12.14	Encourage kitchen gardens (compost) and backyard production of high-value agricultural crops and integrate farm activities with household enterprises. Example: production and use of organic fertilizer.	■	■
12.15	Use agroforestry techniques like integrating woody perennials in shifting cultivation areas to enhance carbon storage capacity.	■	■
12.16	Introduce and promote appropriate/relevant farming technologies to local people to prevent them from moving or being nomadic.	■	■
13	<i>Develop and implement a waste management programme on composting, recycling, and re-using of domestic, commercial and other wastes:</i>		
13.1	<b>Conduct public awareness campaign on waste management.</b>	■	
13.2	<b>Mobilize communities to conduct waste management activities.</b>	■	■
13.3	<b>Establish waste management centers for composting, recycling and re-using of domestic, commercial and other wastes.</b>		■
13.4	<b>Establish livelihood options for local communities using waste products.</b>		■
13.5	Develop a national sewage and solid waste management strategy in cooperation with districts and sub-districts, including development of waste management guidelines especially in urban areas.	■	■
13.6	Establish an environmental laboratory to conduct tests and carry out environmental auditing, monitoring and evaluation of pollution-related activities.		■
	<b>PS 4 - Enhancing biodiversity and ecosystem services to ensure benefits to all</b>		

14	<i>Conduct a valuation and accounting of direct and indirect goods and services of biodiversity resources and ecosystems:</i>		
14.1	<b>Promote public awareness on the economic values of ecosystems and biodiversity and the goods, services and ecological functioning these provide.</b>	■	
14.2	<b>Identify and develop a system of economic instruments such as incentives and penalties.</b>		■
14.3	Partner with business and other relevant sectors in sustainable production and consumption of biodiversity.	■	■
15	<i>Safeguard and maintain ecosystem services through promoting the Integrated Water Resource Management Plan:</i>		
15.1	<b>Develop and implement an Integrated Water Management Plan, involving key concerned sectors (forestry, infrastructure, water management authorities) to address pollution and sedimentation.</b>		■
15.2	<b>Monitor pollution/water quality, sedimentation of rivers, soil erosion and implement restoration activities to prevent siltation.</b>	■	■
15.3	<b>Develop water quality standards and establish a water quality laboratory.</b>		■
15.4	<b>Develop and implement payment for ecosystem services (PES) schemes for water resources.</b>		■
16	<i>Develop and promote understanding of national policies on access and benefit-sharing arising from utilization of genetic resources, including biosafety measures:</i>		
16.1	<b>Conduct awareness-raising among policymakers, government and non-government stakeholders, including private sectors and communities to understand the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS).</b>	■	
16.2	<b>Conduct national and local consultations in developing national policies on ABS.</b>	■	■
16.3	Document and monitor genetic resources codes of conduct and best practices in the country.		■
16.4	Develop protocol on access to genetic resources and the fair and equitable sharing of benefits from the use of biodiversity resources.		■
16.5	Respect intellectual property rights regarding traditional knowledge.	■	
	<b>PS 5 - Enhancing implementation of the NBSAP through participatory planning, knowledge management and capacity building, including district and sub-district and community levels</b>		
17	<i>Enhance technical and managerial capacity of officials and staff on biodiversity conservation and management as laid out in the Strategic Action Plan (SAP) and the Capacity Building Plan on Protected Areas under the PoWPA Project of the MAF (cf. also NBSAP Capacity-building Plan Chapter).</i>		
17.1	Enhance capacity of government officials and staff to develop, implement and enforce environment and biodiversity legislations.	■	■
17.2	Implement individual, institutional and systematic capacity building programmes to ensure effective management of programmes toward sustainable agriculture and forestry.		■

17.3	Develop packages and conduct trainings on intensive farming and permanent farming; intensification of soil and water conservation; drought mitigation measures; genetic conservation and germ plasma collection; biological control of coconut pests; species domestication and breeding for production, and other agriculture related issues, especially for rural communities.	■	■
17.4	Improve the capacity of protected area officials and staff in the establishment, management and conservation of protected and conservation areas and monitoring of key threats to them by developing training modules for the officials and staff; conducting training for trainers; and supplementing formal training with in-service training for the staff.	■	■
17.5	Enhance the capacity-building skills of protected area staff on tourism/ecotourism with focus on education and vocational training.	■	
17.6	Establish a Forestry Training Center to ensure effective capacity-building and institutional governance of organizations from the national to the local levels; include training in carpentry and furniture-making.		■
18	<i>Develop an integrated research programme for Timor-Leste and intensify research efforts on the different aspects of forestry, protected areas, agriculture and other ecosystems, such as population studies, ecological studies, water quality assessment, and impact of alien invasive species:</i>		
18.1	<b>Identify and implement research needs and priorities of the different sectors on biodiversity and ecosystems services.</b>	■	■
18.2	<b>Identify and develop capacities for academic centers of excellence on taxonomy, for inventory of species.</b>		■
18.3	<b>Establish botanical gardens, herbariums and zoos to showcase the indigenous flora and fauna of the country and to serve as center for taxonomic and conservation biology research.</b>		■
18.4	Conduct ecological and population studies of various ecosystems; and biology and conservation of endemic and rare species.	■	■
18.5	Conduct basic and applied research in protected areas, taking into consideration the biophysical, economic and social factors of the ecosystem.	■	■
18.6	Conduct research on the taxonomy and potential utilization of commercially and culturally valuable species, species domestication and breeding for production.		■
18.7	Conduct research and development projects to determine sources, extent and impacts of pollutants.		■
18.8	Conduct research and development projects on the relationship of weeds and other invasive alien species with land management practices.		■
18.9	Develop appropriate tools and new facilities for climate change mitigation and adaptation.		■
18.10	Increase support for population studies, ecological studies and studies regarding re-introduction of important but not invasive alien species.		
18.11	Identify carbon rich areas in forest, agro-ecological and other ecosystems and determine carbon stocks and sequestration rates.		■

19	<i>Maintain and put into operation the Clearing House Mechanism (CHM) as the platform for knowledge sharing and networking:</i>		
19.1	<b>Maintain and enhance the CHM server and further develop the information system database.</b>	■	■
19.2	<b>Update information and data on biodiversity through inter-agency collaboration (Timor-Leste CHM Network)</b>	■	■
20	<i>Document and promote indigenous and traditional knowledge, techniques and practices for biodiversity conservation and environmental protection:</i>		
20.1	<b>Document and analyze traditional knowledge as to its relevance to biodiversity conservation (e.g. Tara Bandu).</b>	■	■
20.2	<b>Promote traditional knowledge and practices relevant to biodiversity conservation.</b>	■	■
20.3	Review traditional laws regarding natural resources management and harmonize these with government legislations and regulations. Existing customary laws like Tara Bandu should be considered to contribute to sound environmental management.	■	■
20.4	Document and share indigenous and local knowledge in mitigating the effects of drought and combating land degradation.		■
21	<i>Coordinate with donor partners, the United Nations and regional organizations and explore ways to substantially increase levels of funding and develop joint programmes:</i>		
21.1	<b>Develop joint programmes with relevant sectors for funding by bilateral and multi-lateral partners (e.g., GEF, UNDP, UNEP, FAO and bilateral partners).</b>	■	■
21.2	<b>Establish and/or enhance partnerships and linkages with regional organizations and programmes such as Coral Triangle Initiative (CTI), Partnership for Environmental Management for Seas of East Asia (PEMSEA), Arafura-Timor-Leste-Seas Forum (ATSEA), South Pacific Regional Environment Programme (SPREP), and ASEAN Centre for Biodiversity (ACB).</b>	■	■
21.3	Identify and coordinate with partners who can assist in the implementation of the different capacity-building activities. These include experts/individuals, government and non-government organizations and international donors. Assistance can be technical and/or financial.	■	■
21.4	Promote public-private partnerships in identifying and addressing knowledge gaps and disseminating effective approaches and techniques especially to farmers and other local communities.	■	■
21.5	Encourage and engage major sources of funding support such as the government (oil and gas fund sources) and the private sector to invest in infrastructure such as transportation and ecotourism facilities.	■	■
21.6	Establish a sustainable financing mechanism for ecosystem and environmental research.	■	■
21.7	Consider nature conservation tax.	■	■
21.8	Consider payments for ecosystem/ecological services (e.g., water user tax).	■	■

**Annex IV: Estimation of Timor-Leste’s contribution towards implementation of the CBD’s Aichi Targets based on the country’s NBSAP priority activities.**

For the specific meaning of Timor-Leste priority strategy and Timor-Leste (T-L) individual priority actions refer to Annex III.

<b>CBD Aichi Target</b>	<b>T-L priority strategy</b>	<b>T-L priority actions</b>	<b>Agencies responsible</b>
1) By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	1	1.1, 1.2, 1.3, 1.4	DNGRA, DNMA, DNAAI, NDAH, NDF, NDI, NDPP, NDA, NDMEAs, NDFA, NGOs, Schools/Academia, Media, Private sector, Business sector
2) By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	1	2.1, 3.1, 4.3, 11.1, 15.1, 16.2	DNGRA, DNMA, DNAAI, NDAH, NDF, NDI, NDPP, ALGIS, NDMEAs, Business sector, Schools/Academia, NGOs
3) By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.	1	14.2	DNGRA, DNMA, DNAAI, NDAH, NDF, NDI, NDPP, ALGIS, NDLPCS, Schools/Academia, NGOs, Private sector, Business sector
4) By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	1	4.1, 4.2, 9.4, 11.2, 12.3	DNGRA, DNMA, DNAAI, NDAH, NDF, NDI, NDPP, NGOs, MAF-ALGIS, Business sector, Academia

5) By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	2	7.3, 7.4, 9.1	DNGRA, DNMA, DNAAI, NDAH, NDF, NDI, NDPP, ALGIS, NDLPCS, Business sector, Private sector, Schools/Academia, NGOs
6) By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that over-fishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	2	11.1, 11.2, 11.3	DNGRA, NDFA, DNMA, DNAAI, NDI, NDPP, ALGIS, ME, Business sector, Private sector, Schools/Academia, NGOs
7) By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	2	4.1, 4.2, 12.3	DNGRA, DNMA, DNAAI, NDAH, NDF, NDPP, ALGIS, NDLPCS, SSAA, NDFA, NDA, NDI, NDL, Business sector, Private sector, Schools/Academia, NGOs
8) By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	2	15.1, 15.2	DNGRA, DNMA, DNAAI, NDI, NDLPCS, ALGIS, NDFA, Business sector, Private sector, Schools
9) By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	2	8.1, 8.2	DNGRA, DNMA, DNAAI, ALGIS, NDFA, NDF, NDA
10) By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable	2	9.1, 12.1	DNGRA, DNMA, DNAAI, ALGIS, NDFA, NDF, NDA,

ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.			NDI, NDLPSCS, Business sector, Private sector, Schools
11) By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	3	10.1, 10.4, 10.5	DNGRA, DNMA, DNAAI, ALGIS, NDFFA, NDF, NDA, NDI, NDMEAs, NDLPSCS, NDAH, NDPP, Business sector, Private sector, Schools
12) By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	3	10.3, 10.6	DNGRA, DNMA, DNAAI, ALGIS, NDFFA, NDF, NDA, NDI, NDMEAs, NDAH, NDPP
13) By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	3	10.6, 12.1	DNGRA, DNMA, DNAAI, NDFFA, NDF, NDA, NDI, Business sector, Private sector, Schools
14) By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	4	9.1, 15.4	DNGRA, DNMA, DNAAI, ALGIS, NDFFA, NDF, NDA, NDI, NDAH, NDPP, Business sector, Private sector, Schools
15) By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded	4	9.1, 15.2	DNGRA, DNMA, DNAAI, NDF, NDA, NDI, NDAH, NDPP

ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.			
16) By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	4	16.1, 16.2	DNGRA, DNMA, DNAAI, NDF, NDA, NDI, NDAH, NDPP, NDMEAs, Schools/Academia, Business sector, Private sector
17) By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	5		DNGRA, DNMA, DNAAI, NDF, NDA, NDI, NDAH, NDPP, NDMEAs, Schools/Academia, Business sector, Private sector
18) By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	5	9.1, 20.1, 20.2	DNGRA, DNMA, DNAAI, NDF, NDA, NDI, NDAH, NDPP, NDMEAs, Private sector, Business sector, Schools/Academia
19) By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	5	17, 19.1, 19.2	DNGRA, DNMA, DNAAI, NDF, NDA, NDI, NDAH, NDPP, NDMEAs, Private sector, Business sector, Schools/Academia
20) By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011–2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should	5	11.4	DNGRA, DNMA, DNAAI, NDF, NDA, NDI, NDPP, NGOs, Funding agencies, Business sector, Private sector

increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.			
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