

ENVIRONMENT ASSESSMENT (SUMMARY)¹

A. State of the Environment

1. **Population.** In 2015 the population of Timor-Leste was estimated to be 1.25 million, of which approximately 70% live in small settlements in rural areas.² The population relies heavily on the country's natural resources (oil, agricultural land, marine resources, and forests) for its livelihood. The country is highly vulnerable to natural disasters and climate variability and change, and is subject to seasonal food insecurity, high levels of unemployment, and a lack of economic opportunities and basic infrastructure, among other factors. The population is growing by 2.7% per year and is projected to reach 1.85 million by 2030 (footnote 2). This will put further pressure on the country's already degraded environment.

2. **Terrestrial biodiversity.** Timor-Leste is positioned in a biodiversity hotspot comprising a number of globally significant ecosystems and endemic species and is recognized as a region of high plant biodiversity with an estimated 41,000 plant species, including 70% of species endemic to the region.³ Timor-Leste has 30 declared protected areas, which contain the majority of the country's remaining primary forest cover. The country also contains globally significant ecosystems such as tropical rainforest, mangroves, wetlands, and agricultural and marine ecosystems. Approximately 35% of the land area (excluding about 22 square kilometers of water bodies) has some type of forest cover. Based on analysis of satellite images, during 1972–1999, forest cover in Timor-Leste decreased by almost 30%.

3. **Marine biodiversity.** Timor-Leste is part of the Coral Triangle, which harbors more than three-quarters of the world's coral species, more than half of the world's coral reefs, the most extensive mangrove forests in the world (which are spawning), and juvenile growth areas for tuna and other commercial fish species of global importance. The Coral Triangle is home to six of the world's seven marine turtle species; more than 3,000 reef fish species; other marine fauna such as whale sharks and 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.

4. Timor-Leste's coastal waters comprise a rich variety of species and seascapes, but there is no existing comprehensive data on coastal habitats. The shallow coral reefs on the northern coast occupy an area of about 3,000 hectares (ha) comprising several distinct marine ecosystems associated with more than 60,000 ha of coral habitat in the deeper waters. In 2012, marine surveys found seven potentially new marine species and extremely high concentrations of biodiversity, with 734 fish species and 360 species of corals recorded.⁴

5. **Commercial renewable resources.** The Ministry of Agriculture, Forestry and Fisheries, is responsible for marine resource management but has weak institutional capacity. Timor-Leste is in the early stages of developing legislation for sustainable use of marine and coastal

¹ This summary is based on data from the following sources: World Bank. 2009. *Timor-Leste: Country Environmental Analysis*. Washington, DC; Asian Development Bank (ADB). 2012. *Strengthening the Regulatory Framework for Environmental Impact Assessment*. Manila; ADB. 2012. *Developing Resettlement Safeguards Capacity in the Transport Sector*. Manila

² Government of Timor-Leste, Ministry of Finance, General Directorate of Statistics; and United Nations Population Fund. 2011. *Population and Housing Census 2010: Population Projection Monograph*. Volume 8. Dili;

³ This hotspot is situated north of Australia and bounded by Sulawesi to the north and Papua New Guinea, Solomon Islands, Tuvalu, and Samoa to the east.

⁴ ADB. 2014. *State of the Coral Triangle: Timor-Leste*. Manila.

resources and inshore fisheries. This is being strengthened through the Asian Development Bank's regional technical assistance to the Coral Triangle Initiative (footnote 3).⁵

6. **Nonrenewable resources.** The government expects that petroleum revenues will be a key pillar of the economy for decades. The risk of oil spills during extraction and transportation is one of the main environmental threats identified, especially for marine and coastal environments. The government has made investigation of a potential pipeline and liquefied natural gas plant on the south coast a priority and is requiring relevant ministries to provide staff with training on environmental issues around oil and gas production.

7. **Climate change.** Timor-Leste is exposed to a range of impacts from global climate change, of which sea-level rise, increases in flooding, drought and heat extremes, increased intensity of tropical cyclones, and ocean warming and acidification are of greatest concern. Because of Timor-Leste's maritime location, the extent of warming is projected to be substantially lower than the global mean surface warming over land due to the moderating influence of sea surface temperatures. Under a moderate emissions scenario, seasonal temperatures are projected to increase from 1.0 degree C to 1.5 degrees C by 2050 although under the current emissions trajectories, warming in Timor-Leste could exceed 3.0 degrees C by 2100. Projected rainfall patterns are more uncertain due to the difficulties of modeling the complex terrain of Southeast Asia, and median projections from the model ensemble suggest modest reductions in precipitation (up to -10%) by the end of the century.

B. Key Environmental Issues

8. **Environmental issues and problems.** The most pressing environmental problems include deforestation, land degradation, natural disaster vulnerability due to climate variability, poor water quality and water scarcity, waste management, and loss of biodiversity and ecosystem services. Climate variability frequently causes droughts and floods, which are likely to increase in frequency and intensity due to climate change. Land degradation is associated with unsustainable agricultural practices and overgrazing. Water scarcity is high in northern parts of the country, and poor water quality is a serious issue in many urban areas.

9. **Deforestation.** Timor-Leste has experienced massive deforestation; estimates of clearing of original forest cover are as high as 90%. Most land shows evidence of clearing, especially slash-and-burn cultivation, harvesting of firewood, coffee growing, and grazing, even on steep slopes. Forest cover has steadily declined since the 1970s and the current deforestation rate is thought to be about 1.3% per annum. A major driver is conversion of forest to agricultural land. The anticipated population growth in rural areas poses a threat, as it may lead to more land clearance and could result in a 1.8% annual deforestation rate.

10. **Mangrove depletion.** Coastal mapping shows significant and ongoing coastal habitat loss in Timor-Leste. The total extent of mangrove forest decreased from 9,000 ha in 1940, to 3,035 ha in 2000, and then to 1,802 ha in 2008, representing a 40% loss during 2000–2008 (footnote 4). This loss is mainly due to trees harvested for timber and fuel wood, establishment of brackish water fish ponds, and extraction of salt from mangrove fringes.

11. **Land degradation.** There are four major causes of land degradation in Timor-Leste: (i) unsustainable agricultural practices, such as slash-and-burn agriculture; (ii) illegal logging of

⁵ ADB. 2010. *Regional Technical Assistance for Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific*. Manila.

native wood species; (iii) extraction of fuel wood; and (iv) fire. All four cause increased runoff and sediment deposits in coastal environments, particularly during the heavy rain and flash flooding that occurs in nearly all of the country's districts. Further, the longer-term impacts include soil erosion and landslides in the uplands, as well as disastrous floods in lowland areas. This is further exacerbated by overgrazing (mainly by goats). Land degradation is not only a threat to agricultural productivity and food security, but it is also likely to affect the water resources (via erosion affecting water bodies), biodiversity (via land habitat loss, and coral reef and coastal fishery degradation) and soil (via soil loss).

12. **Water security and waste management issues.** Some parts of Timor-Leste experience extreme conditions, with little or no rain for almost eight months of the year and large-scale flooding during the rainy season. Water pollution is apparent and is generally attributed to domestic sewage and waste, domesticated animals, and sedimentation due to soil erosion. Further, nonexistent sewage systems and inadequate systems for the collection and disposal of wastewater and solid waste have resulted in widespread pollution of groundwater. There are no effective waste management systems in place, which could become a major problem in highly populated areas and in several coastal areas visited by tourists. Dili has a basic sewerage system and limited collection and disposal of solid waste. However, large piles of rubbish accumulate due to illegal dumping, which pollutes groundwater used for drinking water supply. The only official landfill is used as a dump site for practically all types of wastes, including some hazardous wastes. Because of poor waste management systems, only about one-third of Timor-Leste's population has access to improved sanitation.

13. **Loss of biodiversity and ecosystem services.** Deforestation is a significant cause of loss of both biodiversity and ecosystem services. Marine areas and a number of marine species are threatened. Lack of waste management poses a significant threat to marine ecosystems and nearby marine areas. The diverse ecosystems of the Coral Triangle are threatened by overfishing, pollution, and coral bleaching exacerbated by climate change. Key ecosystem services such as coastal zone protection against severe floods and storms are diminishing as coral reefs and mangroves are being degraded.

14. **Overfishing.** Demand for fish by coastal populations is a primary cause of overfishing. Curtailing overfishing presents a significant challenge for the government, given its weak enforcement capacity and, in some cases, a lack of appropriate fishing regulations. For example, there are no limits on either the fishing gear that may be used, or the size or volume of fish that may be taken. The Asian Development Bank's State of the Coral Triangle Report for Timor-Leste notes that one of the first studies conducted after independence reported evidence of overfishing and detailed its impact on fish assemblages.⁶ This study reported lower fish family richness than before, as well as fewer snapper and parrotfish at sites in Dili as compared to elsewhere. Such results suggest that the negative impact of the current fishing effort on fish abundance is greatest in the fishing grounds in and around Dili.

15. **Threatened species.** Many species are threatened with extinction, especially those that rely on forest areas. In addition, many marine species have been identified as endangered, and a number of turtle species are at high risk of extinction. Harvest and trade in threatened species remain rampant in Timor-Leste. For example, sea turtles and their eggs, shark fins, shells, and corals are openly sold in the country's supermarkets. According to the International Union for Conservation of Nature, three tree species, four birds, three mammals, and one butterfly are considered threatened with extinction.

⁶ ADB. 2014. *State of the Coral Triangle in Timor-Leste*. Manila

16. **Natural disaster risks.** The 2012 World Risk Index ranked Timor-Leste the ninth most disaster-prone country globally based on high exposure to natural hazards and climate change in combination with high societal vulnerability.⁷ Annual heavy seasonal rain falling on steep slopes causes frequent flash flooding, landslides, and erosion. The country is at risk of tropical cyclones and storms as well as coastal flooding; drought is a serious problem in large parts of the country as well. Earthquakes are common. Disasters cause crop damages (leading to food insecurity and famine), infrastructure damages, house destruction (forcing people to move), and high economic losses. Climate change is predicted to further aggravate these issues (para. 17).

17. **Climate change and adaptation.** Timor-Leste's National Adaptation Programme of Action proposes the following priority areas for adaptation, with implementation by 2020: (i) increasing food security by reducing agricultural vulnerability to flood and drought; (ii) securing water resources by emphasizing integrated water resources management; (iii) protecting human health through enhanced capacity to anticipate and respond to changes in the distribution of climate-sensitive diseases; (iv) improving institutional and community capacity to prepare for and respond to natural disasters; (v) maintaining and restoring forests, biodiversity, and coastal ecosystems; (vi) improving sustainability of livestock production; (vii) improving regulations, standards, and compliance for climate-resilient physical infrastructure; (viii) adapting offshore oil and gas infrastructure to withstand increasingly strong storms and waves; and (ix) developing and ensuring coherence in national institutional capacity for managing climate change.⁸

C. Country Partnership Strategy and Focus Areas

18. The platform for protecting and enhancing the quality of the environment in Timor-Leste has been created and efforts are underway to improve the database for environmental management. Immediate priorities include (i) addressing waste management and pollution, (ii) addressing deficient water quality and sanitation, and (iii) addressing gaps in environmental legislation and building capacity for implementation.

19. The Asian Development Bank is helping to strengthen country safeguard systems through technical assistance and project-based capacity building.⁹ Focus areas for the country partnership strategy include the following:

- (i) Ensuring that projects and/or investments do not contribute to land degradation or waste management issues and, wherever possible, including climate-proofing measures and adaptation for resilience.
- (ii) Providing additional technical and financial support for waste management, water supply, and/or urban development projects to strengthen sector policies and regulation.
- (iii) Promoting improved coordination between executing agencies and government agencies responsible for land and environmental management.
- (iv) Supporting executing agencies' use of the formal legal processes and full compliance with country safeguard system requirements.
- (v) Enhancing capacity building of project management unit staff, consultants, nongovernment organizations, and other stakeholders on environmental issues and challenges nationally and locally, including through public awareness and encouraging participation on policy dialogues.

⁷ Alliance Development Works. 2012. *World Risk Report, 2012*. Berlin

⁸ Government of Timor-Leste, Secretary of State for Environment. 2010. *National Adaptation Programme of Action (NAPA) on Climate Change*. Dili

⁹ Environment and Social Safeguards Assessment (summary) (accessible from the list of linked documents in Appendix 2 of the Country Partnership Strategy: Timor-Leste, 2016-2020.