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Assessment of Climate Vulnerability and Resilience in Timor-Leste

Final Report: Proposals

Reference: Work Package 4

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Executive summary

The Foreign, Commonwealth and Development Office (FCDO), Government of UK has commissioned a study to inform the British Embassy Jakarta's overall engagement with Timor-Leste in relation to climate change as well its strategy and approach for its Official Development Assistance (ODA) programming portfolio in Timor-Leste.

The purpose of this study is to identify strategic entry points and pathways for deploying potential UK technical and financial assistance in a way that is responsive to, and supportive of, the Government of Timor-Leste's priorities. These entry points and pathways will enable improved outcomes for communities in Timor-Leste and support the Timorese government and society to diversify the economy and foster sustainable development in the face of climate change. This will contribute towards the ambition set out in the Timor-Leste Strategic Development Plan 2011-2030 [1] which emphasises the importance of economic diversification.

Given the limited timeframe of the study and constraints in engaging with key stakeholders, these findings will need further review and research in order to develop detailed projects and programs within the themes identified.

Approach to analysis

In Work Package 1, priority sectors were identified based on a critical review of Timor-Leste's vulnerability and exposure to climate change and the follow-on implications for social and economic development. Work Package 1 was prepared based on a desktop review of key documentation and refined by engagement with stakeholders from the Government of Timor-Leste and multilateral agencies. Vulnerable sectors with high implications for social and economic development were found to include agriculture, health, water and sanitation, environment, education, and infrastructure. These sectors are also interdependent, creating increased vulnerability to cascading impacts. For instance, poorer sanitation and hygiene as well as lower agricultural output compound health and productivity impacts, while disruptions to infrastructure and education access have both short and long-term impacts on economic growth. Moreover, climate-related risks within these sectors disproportionately impact vulnerable populations, including rural communities, women, and children.

The purpose of Work Package 2 was to provide an understanding of the enabling environment and potential barriers for effectively deploying UK technical and financial assistance to inform our final recommendations to FCDO. Work Package 2 comprised an interrogation of climate-related institutional, legal, and financial arrangements including enablers and constraints; and mapping external technical and financial assistance for climate-focused programs including multilateral and bilateral ODA finance to further distil the sectors identified in Work Package 1. While it was clear that the importance of climate change is recognised at the strategic level, engagement with key ministries and authorities under this study, such as Ministry of Health and the National Designated Authority for Combatting Climate Change among others, revealed that there is still relatively low engagement with and ownership of activities under the NAP.

Work Package 3 outlines the opportunities for FCDO to provide Timor-Leste with either financing or technical assistance that would support increased access to finance for climate resilience initiatives. Climate financing or funding was defined as the flow of funds to all activities, programmes or projects aimed at social capital, infrastructural development, and economic development. It identified a number of sectors that present opportunities for FCDO to engage, based on the assessment of current funding; ability of government to access additional funding; and the potential for FCDO to add value. Education, environment, social inclusion and equity, and water and sanitation are all sectors that are recommended for further exploration, based on potential for impact, urgency and priority.

The ability of the government to access additional financing and clearly link that financing to climate change resilience emerged as a weakness in a range of sectors and could be a targeted area of focus to ensure that the government can access, manage and distribute funds. With improved capability in this area, the government would also be able to better access private finance and structure financing in sectors where there may be bankable opportunities, such as electricity. Appropriate regulatory and policy frameworks would also facilitate access to finance, as discussed in more detail in the next section.

Key insights informing the identification of priority sectors

Strategic entry points and pathways have been identified across priority sectors distilled in this study. These sectors represent those which are most vulnerable to climate change, have significant implications for social and economic development due to their cross-sectoral interdependencies, and have a clear gap in terms of existing financial and technical assistance. Furthermore, the prioritisation of these sectors reflects the institutional, legal, and financial arrangements relating to climate resilience to identify enablers and constraints for the successful implementation of actions and ODA programming.

Based on desktop analysis and limited engagement with stakeholders within Government of Timor-Leste, six sectors have been prioritised for the UK to provide technical and financial assistance to improve resilience to climate change. These sectors include:

- Environment
- Social Inclusion and Gender Equity
- Water and Sanitation
- Health
- Education
- Roads and Bridges.

While the Timor-Leste government has already identified specific climate adaptation actions and opportunities for these sectors in the National Adaptation Plan (NAP), the Post Disaster Needs Assessment (PNDA), and the preliminary Integrated Vulnerability Assessments (IVA), there is limited evidence of progress. Addressing climate-related risks within these sectors will unlock cascading benefits in Timor-Leste.

Opportunities for FCDO engagement

Based on the analysis undertaken in Work Package 1, Work Package 2, and Work Package 3, and on the actions already identified by the government in the NAP, PNDA, and IVAs, entry points for FCDO to engage priority sectors were identified across the following five themes in Work Package 4:

1. Building human and institutional capacities
2. Integrate climate strategies into ministry lines and procurement policies at the national and sectoral levels
3. Empower communities to adopt and implement climate-resilient practices
4. Build new/ retrofit existing water infrastructure for climate resilience
5. Support government to strengthen evidence base through data collection and processing

Within these themes, a number of activities FCDO could undertake have been identified to deliver impact and support climate resilient development in Timor-Leste. These activities represent a preliminary list of opportunities identified, and would benefit from additional research and engagement with key stakeholders in Timor-Leste to further refine and develop these proposals.

Through this review of Timor-Leste's vulnerability and exposure to climate change and an interrogation of existing frameworks and policies that can enable investment, a number of climate-focused programmes and investment in the nation have been identified, based on relevant success criteria. The recommendations developed in this study will inform the nature of FCDO's future decision-making in Timor-Leste and the potential support they can provide in building climate resilience. In particular, the recommendations provide guidance in ensuring that the FCDO programming is strategic and impactful, cognisant of appropriate political and technical entry points; producing outputs that are politically savvy and informed; and identifying areas of inadequacy in existing research to steer future studies.

Glossary

Term	Definition
Adaptive capacity	The capability of a human system to adjust to climate change (including climate variability and extremes), to moderate possible changes, to maximise opportunities, or to cope with the consequences. [2]
FCDO	United Kingdom Foreign, Commonwealth and Development Office
H-NAP	National Health Adaptation Plan
INFF	Integrated National Financing Framework
MAF	Timor-Leste Ministry of Agriculture and Fisheries
MHESC	Timor-Leste Ministry of Higher Education, Science and Culture
MOH	Timor-Leste Ministry of Health
MPW	Timor-Leste Ministry of Public Works
MDB/MDBs	Multilateral Development Bank/ Multilateral Development Banks
NAP	National Adaptation Plan
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution
NDCC	Timor-Leste National Directorate for Climate Change
ODA	Official Development Assistance
PPP/PPPs	Public Private Partnership/ Public Private Partnerships
Resilience	Capacity of individuals, communities, institutions, businesses and systems to survive, adapt and thrive, no matter the kind of chronic stresses or acute shocks they experience. [3]
SSE	Timor-Leste Secretariat of State for the Environment
UNDP	United Nations Development Programme
Vulnerability	Refers to both physical and ecosystem vulnerabilities associated with climate change stressors, including the structural capacity of infrastructure and environmental conditions, and human vulnerabilities in relation to basic psychological needs, provision of food water and sanitation, energy and shelter. [4]

1. Introduction

1.1 Background

Climate change and natural hazards pose a significant threat to Timor-Leste, an island country located in Southeast Asia. The nation is particularly susceptible to earthquakes, cyclones, tsunamis, and heavy rainfall. Due to inadequate infrastructure and social vulnerabilities, the country has a low adaptive capacity and high sensitivity to these hazards. Therefore, it is crucial to identify effective levers and opportunities to help build climate resilience in Timor-Leste.

Since 2006, when the UK closed its Embassy, the bilateral relationship has been managed from the UK Embassy in Jakarta. The UK Government's Integrated Review 2021 recognised the need to strengthen its presence and partnerships with countries in the Indo Pacific region, including Timor-Leste. As an ASEAN Dialogue Partner, the UK is also keen to support Timor-Leste's accession to ASEAN, a process to which the bloc agreed in principle in late 2022.

The UK is looking to expand its engagement in Timor-Leste, including on development and climate change. In this context, the British Embassy Jakarta commissioned this study to inform its strategy and approach. The primary thematic focus for the study is climate change vulnerability and resilience. This is in reflection of the relevance of climate change to development in Timor-Leste, and the profile of UK ODA funding in the region.

1.2 Purpose of this study

The purpose of this study is to identify strategic entry points and pathways for deploying potential UK technical and financial assistance in a way that is responsive to, and supportive of, the Government of Timor-Leste's priorities. These entry points and pathways will enable improved outcomes for communities in Timor-Leste and support the Timorese government and society to diversify the economy and foster sustainable development in the face of climate change. This will contribute towards the ambition set out in the Timor-Leste Strategic Development Plan [1] which emphasises the importance of economic growth and diversification. This ambition is echoed in more recent government policies and strategies including the Timor-Leste Climate Public Expenditure and Institutional Review [5], the establishment of the Timor-Leste Investment Agency: TradeInvest, and the National Adaptation Plan [6].

The pathways developed in this study will inform future decision-making for the British Embassy of Jakarta in Timor-Leste regarding building climate resilience.

1.3 Study approach

Recognising the existing body of research undertaken on climate action in Timor-Leste, and strategy and planning work done by the Government of Timor-Leste, this study encompassed comprehensive desktop review and engagement with stakeholders across the Government of Timor-Leste to identify priority sectors and real opportunities for building climate resilience. These were screened through engagement with FCDO to ensure strong alignment with the strategic priorities guiding the British Embassy in Jakarta.

The study comprises four work packages, set out in Figure 1.

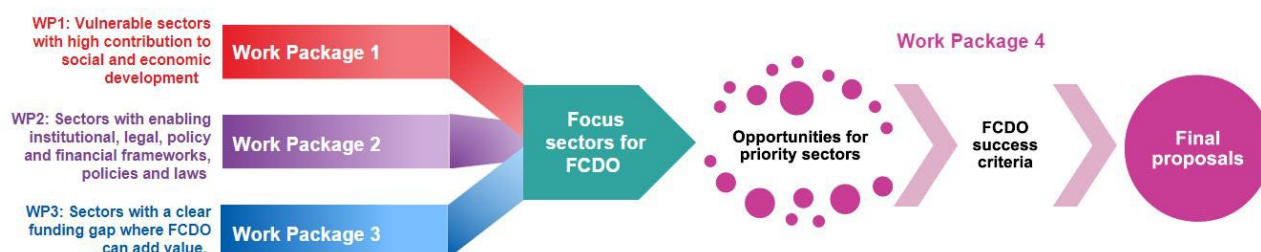


Figure 1: Structure of this study

The identification of selected priority sectors for climate change-related assistance in Timor-Leste was based on a rigorous assessment comprising desktop review and engagement with stakeholders from the Government of Timor-Leste. It included a critical review of Timor-Leste's vulnerability and exposure to climate change and how this impacts social and economic development to understand what sectors will be most impacted by climate change (Work Package 1).

Beginning with the priority sectors identified by the Government of Timor-Leste for economic development in its National Strategic Development Plan 2011-2030, these were screened to narrow down to priority sectors that are most vulnerable to climate change. The analysis also involved examining climate-related institutional, legal, and financial arrangements, including enablers and constraints (Work Package 2), and mapping external technical and financial assistance for climate-targeted programs, including multilateral and bilateral ODA finance (Work Package 3). Analysis of catalysts and constraints allowed screening of opportunities identified from the National Adaptation Plan (NAP) and identification of entry points for FCDO to support the delivery of those opportunities. This analysis led to the selection of focus sectors for technical and financial assistance from FCDO.

Based on the selected focus sectors for FCDO's involvement, proposals were developed to deliver on success criteria developed and agreed with FCDO for the purpose of this assessment¹, and the Government of Timor-Leste's objectives as set out in the NAP and other key strategies.

1.4 Study limitations

This study was limited to desktop review and engagement with the stakeholders from the following Timor-Leste government departments over the period of January to April 2023. These stakeholders included:

- H.E. Ambassador of Climate Change of Timor-Leste
- National Designated Authority for Combating Climate Change – Public Institution (AND I.P. – Portuguese acronym)
- National Procurement Office (NPO)
- National Directorate for Climate Change (NDCC)
- Ministry of Finance
- Ministry of Health (MOH), National Directorate (ND) for Environmental Health

Detailed assessment of climate-related physical and transition risks for sectors is excluded from the study scope. The proposed activities set out in Section 4 are based on desktop review of publicly available documentation and have not included further validation of alignment with the priorities of the Timor-Leste government, or more in-depth review. Other donors and stakeholders should also be further consulted to ensure coordination and that there is not duplication of effort.

¹ These success criteria were identified in a workshop with FCDO during this project to ensure alignment of proposals with broader strategic objectives and project requirements for FCDO.

2. Country context

2.1 Background

Timor-Leste is located in Southeast Asia, at the eastern end of the Lesser Sunda Islands of the Indonesian archipelago. The country spans the eastern half of the Timor Island, the exclave of Oecusse, and the islands Atauro and Jaco, with the capital Dili located on the northern coast of Timor Island. Located within the Coral Triangle, Timor-Leste is a biodiversity hotspot with globally significant ecosystems, tropical rainforests, mangroves, wetlands, and diverse marine ecosystems [6]. The country is approximately 14,954 km², comprising 13 municipalities with a total population of 1,340,434 based on the 2022 Census [7]. With 783 km of coastline, 66% of the country's population live in coastal and low-lying areas [8]. The urban population constitutes 36.8 per cent of the total population of Timor-Leste [7].

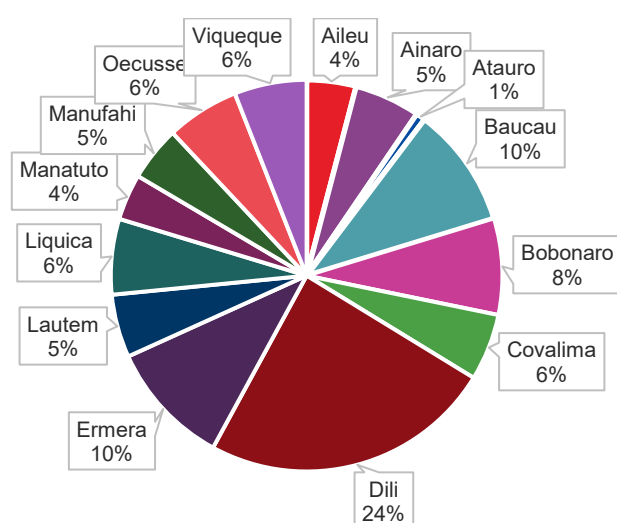


Figure 2: Population by municipality, 2022 [7]

Timor-Leste is a young post-conflict nation, with a well-functioning democracy. It was ranked as the most democratic country in Southeast Asia in 2016, based on the electoral process and pluralism, the functioning of the government, political participation, political culture, and civil liberties [9].

Timor-Leste's National Strategic Development Plan 2011-2030 identifies its development priorities in 16 key sectors across three key pillars: social capital, infrastructural development, and economic development. The Climate Public Expenditure and Institutional Review conducted the Ministry of Finance, Government of Timor-Leste and the United Nations Development Programme (UNDP) in 2022 maintains these 16 sectors as priorities for national development. It is important to note that while these sectors remain relevant, the change in economic circumstances since the formulation of the National Strategic Development Plan should be considered when reviewing specific sectoral targets and growth strategies.

Table 2-1: Timor-Leste's development priorities in 16 sectors [6]

Social capital	Economic development	Infrastructure development
Education	Rural development	Telecommunications
Health	Agriculture	Airports
Social inclusion	Petroleum	Sea ports
Environment (including ecosystems and biodiversity)	Tourism	Electricity
Culture and heritage	Private sector	Water and sanitation
		Roads and bridges

The National Strategic Development Plan is focussed on delivering economic development to the people of Timor-Leste, and the broad range of sectors included addresses the need to diversify from oil and gas and strength human capital development [1]. Timor-Leste is among the most oil-dependent economies in the world and is heavily reliant on petroleum. This remains a key sector despite Timor-Leste's petroleum resources being practically depleted: oil and gas production was previously being predicted to finish in 2021 but recent explorations show that it could extend until 2024/2025 [10]. Oil and gas accounts for 90% of the country's Gross Domestic Product (GDP) and 70% of government spending [10]. Despite the high dependence on the petroleum sector for national revenue, only 0.1% of the population are directly employed in the sector [11] in comparison to approximately 64% of the population depending on agriculture for their livelihood [5]. The need to transition into a more diversified economy represents an opportunity to focus on other key sectors to drive development. Bringing a climate resilience lens to those sectors will be critical to ensuring that they can support Timor-Leste's growth ambitions.

In order to bring a climate resilience lens to development activities, it is important to recognise the traditional Timorese custom of Tara Bandu, which plays a critical role in the involvement of local communities in resilience-building efforts and is recognised by the Government of Timor-Leste as a local customary law for protecting and conserving the environment and use of natural resources in a sustainable manner [6]. Tara Bandu is a custom that regulates people-to-people, people-to-animals, and people-to-environment relations to promote peace and reconciliation through public agreement. The custom involves the hanging of a culturally significant item from a wooden shaft to place a ban on certain agricultural or social activities within a given area. Tara Bandu represents an important entry point for strengthening natural resource management systems and addressing identified conflict drivers in communities. There has been limited validation of the role of Tara Bandu in climate resilience action planning in Timor-Leste as part of this study, therefore it is recommended that this is considered as a next step (detailed in Section 4.2).

2.2 Climate change and vulnerability in Timor-Leste

2.2.1 Approach

To evaluate the impact of climate change on Timor-Leste, a screening was conducted based on the methodology of the World Bank National and Policy Climate and Disaster Risk Screening Tool. This methodology integrates key elements of risk analysis frameworks adopted by the Intergovernmental Panel on Climate Change (IPCC) and the vulnerability assessment framework utilised by the United States Agency for International Development (USAID). It identified priority sectors vulnerable to the impacts of climate change that are most critical for achieving national development goals.

The screening process involved characterising the environmental, socio-cultural, and economic conditions of Timor-Leste, and identifying climate-related impacts for priority sectors. The screening comprised a desktop review of key strategies and reports including the preliminary findings from the Timor-Leste Integrated Vulnerability Assessments (IVA). Full details of the approach and findings can be found in Work Package 1. This desktop assessment was supplemented by a review from a local expert, who has worked extensively in and with government on climate change strategy and planning.

2.2.2 Summary

Timor-Leste is considered one of the most vulnerable and disaster-prone countries in the world due to high levels of sensitivity to hazards and low adaptive capacity [6] [12]. Despite improvement on Human Development Index (HDI) factors including education, health, and income, the country still suffers high rates of child mortality, malnutrition, and non-communicable diseases [5]. The population faces multiple challenges, such as widespread poverty, an underdeveloped economy, and poor access to water and sanitation [13]. Approximately 42% of the population is classified as living below the poverty line, based on data collected in 2014 [10].

The country is particularly susceptible to a range of climate-related hazards, including flooding, erratic and extreme rainfall, landslides, tropical cyclones, coastal erosion, strong winds, heatwaves, drought, forest fires, sea-level rise, ocean acidification, epidemics, earthquakes, and tsunamis.

According to the National Adaptation Plan, Timor-Leste experienced 470 disaster events between 2001 and 2011, of which floods accounted for 71% [6]. The Post Disaster Needs Assessment, prepared jointly by the

Government of Timor-Leste, the UN, and the World Bank, estimates the total cost of damage and loss to be US\$307.7 million and US\$530 million for recovery needs across social, productive, infrastructure, and crosscutting sectors [8].

Climate change is expected to have a significant impact on Timor-Leste, given its high level of vulnerability. Rising temperatures, heatwaves, and more intense and frequent extreme rainfall events, will result in floods, landslides, and forest fires across the country. Generally, projections suggest that wet seasons will become wetter, while dry seasons could become slightly drier [6]. Increasing atmospheric temperatures coupled with longer periods of drought may increase forest fires and water scarcity in Timor-Leste. While the number of tropical cyclones may decrease, their intensity will likely increase. Furthermore, rising sea levels will pose a persistent threat to the country's coastal regions, which are home to 66% of the total population [8] [14]. Ecotourism opportunities may also be undermined by damage and degradation of existing assets such as coral reefs, mangroves and beach areas through processes such as coastal erosion and coral bleaching.

These changes will have far-reaching risks and promote very few opportunities for key sectors, while causing considerable damage and downtime to critical infrastructure and livelihoods.

Potential benefits from climate change are limited to agriculture where increasing carbon dioxide concentrations and temperature may benefit certain crops such as rice, sweet potato, and peanuts. If effective management and diversification of these crops is implemented, improved yields and expansion of agricultural land may be enabled in some areas, creating new opportunities in the agricultural sector. However, these benefits may be offset or cancelled out by risks to agriculture, such as lower reliability and quality of water, soil quality impacts and erosion.

Table 2-2 outlines the qualitative projected changes in climate variables in Timor-Leste based on quantitative projects under high emissions scenarios. These projected changes pose a range of direct and indirect climate-related risks for priority sectors, summarised in Table 2-3. More detail on the impacts of these climate variables on key sectors is provided in Work Package 1. Note that the water and sanitation sector has been addressed separately to infrastructure development because of its prioritisation as a sector with notable opportunities and associated activities in the NAP.

Table 2-2. Overview of projected changes in climate variables in Timor-Leste

Climate variable	Description of projected change in variable
Temperature	Average daily maximum temperature is projected to increase along with the frequency and severity of hot days (above 35° C) and extended heatwaves. Warming atmospheric temperatures increase the frequency of intense storms, forest fire risk, and ocean acidification.
Precipitation	There is significant uncertainty in projected changes in annual precipitation across Timor-Leste. Generally, it is predicted that there will be a decrease in dry season rainfall and an increase in wet season rainfall. The intensity and frequency of heavy rainfall events is predicted to increase. Changes to precipitation patterns will have significant implications for reduced surface water and groundwater availability. Additionally, higher than average rainfall can lead to increased flooding, landslides, and erosion.
Drought, forest fire, flooding and landslides	Increasing frequency and intensity of extreme weather events with longer dry seasons are leading to more pervasive droughts [6], which are typically associated with El Niño years and, in the years following, higher than average rainfall can lead to increased flooding. Drier conditions increase risks of forest fire and reduce quantity of water sources. In addition to infrastructure and environmental damage, flooding can frequently cause additional run-off, soil erosion and landslides, causing land degradation and contamination of water sources.
Cyclones	Tropical cyclones can affect Timor-Leste and while their effect currently tends to be relatively weak due to the country's proximity to the equator [6], they can have significant impacts. While cyclones are projected to occur less frequently in the future, they are projected to increase in intensity with increased wind speeds. Cyclones can cause secondary hazards, as in the case of Tropical Cyclone Seroja in 2021 where heavy rainfall and strong winds resulted in flash flooding and landslides across all thirteen of the country's municipalities [10].
Sea level rise	Sea level rise is expected to continue, increasing the impact of storm surges, coastal flooding, and associated saltwater intrusion.

Climate variable	Description of projected change in variable
Ocean acidification	Oceans are absorbing a large amount of the yearly carbon dioxide emitted to the atmosphere, increasing their acidity. This is expected to increase, negatively affecting the development of corals, including risk of coral bleaching.

Table 2-3: Direct and indirect climate-related risks across key sectors

Sector	Climate variables	Direct risk impacts	Indirect risk impacts
Agriculture	• Temperature • Precipitation • Flooding • Drought • Forest fire • Sea level rise	• Degradation of farming land leading to crop failure, lower productivity, lower national revenue and inhibited rural development • Increased irrigation demand but lower quality and availability of water	• Food insecurity and malnutrition due to disruption of production and higher food prices • Disruption to supply chains affecting agriculture and other major industries (including private sector)
Education	• Flooding • Landslide	• Damage and temporary closure or loss of access to schools/education infrastructure	• Higher levels of absenteeism among students due to increased diseases or disruptions • Damaged sanitation facilities in schools and/or increased demands at home discouraging attendance of women and girls
Environment	• Temperature • Precipitation • Flooding • Drought • Landslide • Forest Fire • Ocean Acidification	• Native species extinction, loss of biodiversity, increased likelihood of trophic collapse	• Declining ecosystem services, including carbon sequestering, water filtration, pest control • Coastal erosion and infrastructure damage, impacts on livelihoods that depend on natural resources, fewer employment opportunities for coastal communities • Decreased mental wellbeing, loss of identity, place, and cultural heritage • Declining fish stocks and food insecurity
Health	• Temperature • Precipitation • Humidity • Flooding • Drought • Landslide • Cyclone	• Heat and humidity-related illness and death (e.g. pneumonia and respiratory tract infections) • Increased incidences of vector-borne and waterborne diseases such as cholera and typhoid fever • Disproportionate impact on rural areas and vulnerable groups including women and children who have poor access to services	• Reduced labour force productivity, impacts on livelihoods • Disruption to healthcare services and damage to health infrastructure due to extreme weather events
Roads and bridges	• Flooding • Cyclone • Landslide	• Damaged infrastructure, including transport, eroding investments and leading to isolation of vulnerable communities and lack of access to basic services	• Interrupted logistics and access routes further reduces productivity and enterprise opportunities, limiting economic growth • Long travel times to health facilities, low access to healthcare services

Sector	Climate variables	Direct risk impacts	Indirect risk impacts
			(particularly for women and rural communities) likely to ultimately lead to lack of treatment
Electricity and communications	- Flooding - Cyclone - Landslide - Sea Level Rise	Damaged infrastructure, such as electricity and telecommunications, eroding investments and leading to isolation of vulnerable communities and lack of access to basic services	Emigration from coastal areas lowers the overall resilience of coastal communities as more vulnerable people are unable to relocate
Petroleum	- Sea level rise - Cyclone	Increased health and environmental risks from spillage/release of oil and potentially hazardous contaminants	Reduced national economic revenue from damage to oil and gas infrastructure
Tourism	- Temperature - Precipitation - Flooding - Drought - Cyclone - Ocean acidification - Sea level rise	- Major transport disruption due to damage to tourism infrastructure (i.e. airports, bridges) - Degradation of natural tourist attractions (e.g., beaches, reefs, forests)	- Reduced tourism due to safety concerns from natural hazards and public health risks (vector- and water-borne diseases) - Lower economic opportunities increase poverty, migration, and social unrest, further deterring tourism
Water and sanitation	- Precipitation - Flooding - Drought - Sea level rise	- Damage to water infrastructure reduces access to water - Lower availability and quality of water due to contamination and saltwater intrusion - Increased incidence of waterborne diseases and health issues related to lack of hygiene and sanitation	- Reduced availability of freshwater for irrigation increases crop failures and reduces agricultural productivity - Increased school and work absenteeism especially for women and girls travelling further for water
Sea ports and airports	- Flooding - Cyclone - Landslide - Sea level rise	Damaged infrastructure, including transport, ports, leading to isolation of vulnerable communities and lack of access to basic services	- Disruptions to supply chains reducing productivity, increasing prices and increasing vulnerability due to lack of access to goods and services - Increased flooding and sea level rise may impact on airport and seaport investments if not incorporated into site and building processes

Several climate variables have direct and indirect risks across multiple sectors, with some compounding impacts. This is particularly true for the sectors of environment, water and sanitation, health, agriculture and infrastructure (which is a combination of sea and airports, electricity and telecommunications, and roads and bridges).

These sectors have many climate variable inputs and the risks have interactions across other sectors. Poorer sanitation and hygiene as well as lower agricultural output compound health and productivity impacts, while disruptions to infrastructure and education access have both short- and long-term impacts on economic

growth. Moreover, the risks fall unevenly on the population, with heavier impacts on vulnerable populations, including rural communities, women and girls.

For example, the agricultural sector, on which more than 66% of the rural population depends as a source of income [6], will be impacted by rising temperatures and increasing difference in rainfall between the driest and wettest months, leading to lower farming productivity and crop failure. Meanwhile, as demand for water grows, increased run-off from flooding events and sea level rise both contribute to lower quantities and quality of water available due to contamination and salination. Given the reliance of much of the population on subsistence, rain-fed agriculture and that food production is not sufficient to meet the population's needs [6], these impacts in turn will affect the economic security through reduced income and higher food import expenses, as well as the health of the population through poor access to nutrition.

2.2.3 Key conclusions

Based on the foregoing analysis of climate vulnerability, priority sectors most vulnerable to climate change have been distilled from the 16 key sectors identified by the Government of Timor-Leste for economic development in its National Strategic Development Plan 2011-2030. Climate change and its associated impacts on communities, economic activity, and ecosystems pose major barriers to Timor-Leste achieving post-conflict nation building and its Strategic Development Plan 2011–2030 [1]. While every sector is vulnerable to the impacts of climate and natural hazards, reducing the climate vulnerability of highly interdependent priority sectors will most effectively contribute towards strengthening social and economic development in Timor-Leste.

The sectors that are most vulnerable to climate change and are particularly critical for social and economic development include environment, health, water and sanitation, agriculture, and infrastructure.

Environment is the most interdependent sector in Timor-Leste, and includes the natural resources and associated ecosystem services, such as climate regulation, water purification, and provision of food. Climate-related impacts on the environment in addition to deforestation and land degradation significantly hinder social and economic development in Timor-Leste due to the high dependence on natural resources and ecosystem services for human health and wellbeing, tourism, agriculture and fisheries, education, and rural development. Key climate stressors include an increase in extreme weather events, warming average annual temperatures and changing rainfall patterns, damage to habitat for local species, and loss of biodiversity. The effects of climate on the environment sector are especially relevant for economic and social development as vulnerable groups, including women, are more dependent on climate-sensitive natural resources, with limited alternative livelihood opportunities as well as low involvement in decision making.

A resilient and biodiverse environment underpins two sectors contributing to economic development in Timor-Leste: agriculture and tourism [1]. In addition, a decline in ecosystem services, such as water filtration and pest control, has flow-on effects into health, water, and sanitation. Environmental changes will compound existing stressors related to unsustainable resource management and land use practices including deforestation. Hence, enhancing the resilience of environment sector will support a resilient agriculture sector, improving food security, nutrition, and overall health across Timor-Leste. Environment is also important for water quality and availability.

The centrality of the environmental sector to the other sectors makes it a key sector to focus on for intervention. There is potential to ameliorate the environmental constraints through increased investment and focus on the established Tara Bandu principles.

Health is central to social development and economic development, as low community health and wellbeing substantially disrupts economic productivity, access to education, and overall social development, with a disproportionate impact on vulnerable cohorts. Climate change will impact health infrastructure, access to health services, and will also drive increasing morbidity and mortality.

Climate-related impacts on health infrastructure and public health (including vector-borne and water-borne disease, and heat- and humidity-related illness and mortality) significantly hinder progress on social and economic development. Additionally, impacts to agriculture and the environment are interconnected with health outcomes through malnutrition and disease.

Increased morbidity and mortality rates negatively impact education, employment, and labour productivity, leading to cascading economic outcomes for households, communities, and the national economy. Public health issues can also deter tourism, reducing its potential to generate income and employment opportunities for national and local community economies.

Water and sanitation is fundamental to public health and also impacts agriculture, industry, and access to education and work, especially for women and girls. Less than 50 per cent of the overall population have access to basic sanitation, and lack of access to sanitation is a leading reason for girls dropping out of school [6].

Despite historically having ample freshwater resources, Timor-Leste has considerable vulnerability to water insecurity due to low levels of water management effectiveness, high levels of catchment degradation, and high vulnerability to climate change [6].

Projected changes in rainfall patterns and saltwater intrusion from sea level rise will likely worsen these issues, reducing both the quality and quantity of water available. Extreme weather events such as floods and landslides, which are expected to become more frequent with climate change, typically also compromise the quality of potable water sources and can lead to disease outbreak.

Agriculture is a key employment sector supporting the majority of local employment in Timor-Leste and is highly vulnerable to climate change with direct impacts expected on crop yields, which will affect food security, livelihoods and health outcomes. Approximately 80% of the population is dependent on agriculture for their livelihoods, therefore climate-related impacts on agriculture will substantially impact household income and national employment rate and flow-on impacts for education and health [6] [5]. A thriving and climate-adapted agriculture sector is thus intrinsically linked to other key sectors and so its success is essential so that other sectors can thrive.

The resilience of the agricultural sector depends on stable infrastructure and water supply. Unsustainable resource management (including land use and irrigation) and environmental degradation hinder opportunities for economic diversification into areas such as tourism, deplete natural resources including water for drinking and sanitation, and can cause the deterioration of cultural heritage and significance. Irrigation rates are low and particularly challenging in mountainous areas with river inundation impacting downstream irrigation systems, complicating capacity to implement climate change adaptation measures and increasing the exposure of the sector to changes in rainfall patterns.

Infrastructure including roads and bridges, airports and ports, electricity and telecommunications underpin major growth industries for social and economic development including tourism and agriculture. Without due consideration and planning for climate-related shocks and stresses, infrastructure damage and failure will create cascading impacts for communities and their ability to access basic services and support economic activity. Resilient and effective infrastructure is a critical enabler of economic development. Infrastructure damage and downtime can disrupt work and market access, creating an additional financial burden for households and increasing poverty.

Infrastructure in Timor-Leste has been ranked the 6th most vulnerable in the world, based on 2013 data [6]. Climate and natural hazard-related disruptions cause cascading impacts for health, education, agriculture, tourism, the private sector, and communities due to the heavy reliance on transport infrastructure for movement of goods and services, and access to basic services.

The infrastructure sector is comprised of sub-sectors (e.g., roads and bridge, airports and seaports, and electricity and telecommunications), which are equally affected by climate change and are therefore included jointly in this section. However, due to the different opportunity and investment profiles for each of these subsectors, these are separated out in later sections of this report.

2.3 Climate-related legal, financial, and institutional arrangements

2.3.1 Approach

This section outlines the climate-related institutional, legal, and financial arrangements, including enablers and constraints. In combination with Section 2.4, which maps external technical and financial assistance for climate-targeted programs, potential focus sectors for FCDO's engagement were identified.

A review of institutional, policy, legal and financial arrangements related to climate change adaptation, climate change mitigation and broader development was conducted across government entities to understand current roles for effective climate action. The main focus of the review is climate adaptation, but arrangements related to climate mitigation have also been reviewed for context and due to the close relationship and shared responsibility for mitigation and adaptation activities.

Our review has been informed by various documents published by the Timor-Leste Government (e.g. strategies, policies, government resolutions and decree-laws) and multilateral organisations, as well as through internal consultations with Arup's in-country consultants, CRI Timor, regarding current policy, regulation, key inter-governmental relationships and the future direction of policy in Timor-Leste. A more comprehensive discussion on these arrangements can be found in Work Package 2. The short timeframe of this study limited the potential for wider engagement with key government stakeholders, however, our in-country consultants were able to provide key context and review to inform this analysis.

2.3.2 Summary

There are four key climate-related policies at the national level intended to elevate climate change issues across government and set the direction for climate action. Currently, there is limited evidence available demonstrating their effectiveness, and progress towards implementation, especially considering that most of these policies were published in the last couple years. An overview of these policies, including examples of technical and financial support needed and adaptation priorities, are provided below.

The Strategic Development Plan 2011-2030 establishes the long-term, broad strategic vision for the country's development and was one of the earliest policy documents to highlight the criticality of addressing climate change risks (DRTL, 2011). The Plan makes the connection between climate change and social capital, infrastructure development and economic development, helping to put into context the importance of climate change to Timor-Leste. It established the country's first National Programme of Adaptation to Climate Change (NAPA) and set out the target for 70% of actions under the programme to be implemented by 2030.

It is difficult to assess whether this target has been achieved by the expected timeframe as the programme was consolidated with other adaptation programmes during the development of the National Adaptation Plan. It did, however, achieve its targets to create the Environmental Basic Law and National Biodiversity Law for the protection and conservation of the environment and biodiversity, among others.

The National Climate Change Policy (NCCP) was approved by the Council of Ministers in early 2022 and serves as the central policy framework for guiding the country's national approach to climate action (DRTL, 2022). The main purpose of this policy document is to help strengthen Timor-Leste's climate-related governance and policymaking by reinforcing coordination between government entities and serving as a common reference point for identifying and prioritising future climate-related policies. The National Directorate for Climate Change (NDCC) under the Secretariat of State for the Environment (SSE) is responsible for developing a National Climate Change Strategy and Action Plan to implement the measures that are listed in the NCCP.

An updated Nationally Determined Contribution (NDC) was submitted in late 2022 and reconfirms the country's commitment to climate adaptation and resilience as it is identified as one of four commitment areas (DRTL, 2022). The other areas are climate risk governance, low carbon development, and nature-positive growth and transition. The SSE was tasked with developing the updated NDC. The updated NDC also specifies some urgent areas where technical and financial support are needed for its objectives to be met, many of which overlap with the adaptation priorities of the National Adaptation Plan:

- Understanding climate risks and improving national climate information services
- Designing and regulating effective nature-based solutions
- Developing integrated water management capacity
- Conducting research on food security and transitioning livelihoods
- Improving the capacity of public health infrastructure to cope with climate-related impacts
- Mapping climate vulnerabilities damage risk and potential losses

- Minimising and averting loss and damage through risk transfer solutions and social protection
- Building coastal resilience
- Accelerating and executing mitigation and adaptation objectives through technology transfer

The NAP was submitted to the United Nations Framework Convention on Climate Change in 2021 and it consolidated over seven years of adaptation work from different actors under a single, coherent national programme. The SSE oversees the development and implementation of the NAP at the policy level (SSE, 2021). The NAP sets out a number of concrete adaptation priorities for the country at the policy, sector, and project and programme levels alongside lead entities to deliver them, which has been provided below in Table 2-4. This NAP is the guiding document for government action on adaptation, and while it is subject to review and updates, it provides a comprehensive synthesis of planned actions across all government ministries and for key priority sectors.

Table 2-4: Lead entities of the adaptation priorities laid out in the NAP at policy, sector and project/programme

Adaptation priorities laid out in NAP	Lead entities	Timeline
Policy level		
Finalise the National Climate Change Policy	SSE, NDCC	Completed
Integrate climate-related issues into Tarabandu	SSE, MAF, MPW, Secretary of State for Civil Protection (SSCP)	2-3 years
Sector level		
Infrastructure priorities and programmes	MPW, SSE, Ministry of Urban Planning and Development (MUPD), Universidade Nacional Timor Lorosa'e (UNTL)	Not applicable
Biodiversity and ecosystem priorities and programmes	MAF, SSE, Ministry of Education, Youth and Sport (MOEYS), Ministry of Higher Education, Science and Culture (MHESC), UNTL	Not applicable
Health priorities and programmes	MOH, SSE, UNTL	Not applicable
Agriculture priorities and programmes	MAF, SSE, MOH, MOEYS, MHESC, UNTL	Not applicable
Water priorities and programmes	MPW, MAF, SSE, UNTL	Not applicable
Disaster risk reduction priorities and programmes	SSE, SSCP, MAF, MOEYS, MHESC	Not applicable
Tourism priorities and programmes	Ministry of Tourism, Trade and Industry (MTTI), SSE, MAF, MOEYS, MHESC, UNTL	Not applicable
Project and programme level		
Strengthen the human capacity in managing climate risks	MPW, MAF, SSE, Ministry of Transport and Communications (MTC)	3-6 years
Identify and address the needs of vulnerable communities and group	SSE, MAF, SSCP, MPW	2-10 years
Use an ecosystem-based disaster risk reduction approach in marine environments	MAF, MPW, SSE	3-6 years

Adaptation priorities laid out in NAP	Lead entities	Timeline
Improve water resource management as part of climate action	MPW, MAF, SSE	3-10 years
Promote sustainable land management as part of climate action	MAF, SSE	2-10 years
Improve public health services to manage climate-related health issues	MOH	2-5 years
Build climate-resilient livelihoods	MAF, SSE	3-5 years
Support the ongoing activities under the national support programme	SSE	2-3 years

There are seven government entities that are key actors in Timor-Leste's climate-related governance. These entities have one of two functions: oversight/high-level decision-making or coordination. An overview of these government entities and their functions can be found below:

Table 2-5: Key government stakeholders for climate strategy and planning

Oversight/high-level decision-making
Council of Ministers is the highest decision-making authority regarding mainstreaming of climate change strategies into sectoral policies and plans.
Secretariat of State for the Environment (SSE) under the Coordinating Minister for Economic Affairs is responsible for overseeing NDC implementation and the development and implementation of the NAP at the policy level.
Coordination
National Directorate for Climate Change (NDCC) under the SSE is responsible for coordinating and progressing climate action at the political and technical level by working with sectoral ministries. It coordinates and provides technical support to SSE on NAP implementation and will develop the National Climate Change Strategy and Action Plan.
National Designated Authority for Combatting Climate Change (NDA) under the SSE is responsible for implementing the flexibility mechanisms of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and serving as the point of contact between the Government and the Green Climate Fund (GCF).
Climate Change Working Group (CCWG) was established as the main mechanism for coordination and consultation with different stakeholders on climate change, including NAP implementation. It is chaired by NDCC and its membership body mainly comprises of technical level representatives of relevant ministries, national and international NGOs, and academia.
Special Commission for Climate Finance was recently established as the main mechanism for the facilitation and coordination of climate finance to support priority adaptation and mitigation projects. It comprises high-level representatives from relevant ministries including the Ministry of Finance and Ministry of Foreign Affairs and Cooperation. Other ministries will participate depending on their relevance to the issues being discussed.
Timor-Leste Ambassador for Climate Change sits under Ministry of Foreign Affairs and Cooperation as is the main point of contact for bilateral engagement on climate change matters.

Additionally, there are 15 sectoral ministries and public entities that also have climate-related legal, financial and institutional arrangements that either apply across sectors or are sector specific. These ministries bear much of the responsibility for implementing actions outlined in the NAP. A selection of some of the key arrangements are mentioned here, with further details provided in Work Package 2. Key conclusions around these arrangements that have significance for FCDO can be found in Section 2.2.3.

Legal

- Ministry of Public Works (MPW) has a mandate to integrate climate considerations into the legal framework for water supply and sanitation and the strategy around for its implementation.

Financial

- Ministry of Foreign Affairs and Cooperation (MFAC) is one of the national partners for the Integrated National Financing Framework (INFF) and the Financial Diversification programme, which, among other objectives, aims to assess climate finance budgeting and investments in sectoral plans.
- Ministry of Finance (MoF) is recognised in the NDC and the NAP as a key enabler, and supervises the Contingency Fund to support communities and vulnerable populations affected by climate change, as well as sharing broader responsibility for mobilising international and domestic sources of funding for adaptation plans.
- Ministry of Agriculture and Fisheries (MAF) is one of the leads of IKAN Adapt, one of the key ongoing climate financing programmes, which seeks to strengthen the adaptive capacity, resilience and biodiversity conservation ability of fisheries and aquaculture-dependent livelihoods in Timor-Leste.

Institutional

- Ministry of Higher Education, Science and Culture (MHESC) plays a role in developing human and institutional capacities for ecosystem-based adaptation and embedding climate programmes in higher education according to the NAP.
- Ministry of Health (MOH) has made an unconditional commitment to implement the overarching objectives in the National Health Adaptation Plan (H-NAP) that was put forth in the updated NDC, with specific elements conditional to securing technical and financial support.

2.3.3 Key conclusions

There are four key climate-related policies at the national level that are helping to elevate the national importance of the climate change agenda. These are the Strategic Development Plan 2011-2030, National Climate Change Policy, updated Nationally Determined Contribution, and National Adaptation Plan. These policies are important references for the country's adaptation priorities and areas of technical and financial support urgently required.

Climate adaptation has been a relatively important focus area for the country, where adaptation programmes and projects have been pursued for over seven years. The process of developing the National Adaptation Plan helped to consolidate different initiatives into a coherent plan with clear priorities. It also helped to reinvigorate ministries around adaptation work and instil its importance for the country. However, while the importance of climate change is recognised at the strategic level, engagement with key ministries under this study, such as Ministry of Health, revealed that there is still relatively low engagement with and ownership of activities under the NAP among some ministries to integrate these into sectoral policies.

2.4 Climate-related external funding and financing

2.4.1 Approach

This section outlines the mapping of external technical and financial assistance for climate-targeted programs, including multilateral and bilateral ODA finance. This analysis, in combination with the findings outlined in section 2.3, allowed identification of potential focus sectors for FCDO's engagement. Further details of the assessment is outlined in Appendix C.

Climate financing or funding, for the purpose of this report, has been defined as the flow of funds to all activities, programmes or projects aimed at social capital, infrastructure development, and economic development associated with climate change. Using the same definition as the *UNDP Climate Public Expenditure and Institutional Review 2022*, to determine if an expenditure of project was climate change relevant, the following question was asked: *Would this expenditure help Timor-Leste adapt to or mitigate the impacts of climate change?*

Climate funding and financing is typically delivered through three main sources – multilateral, public and private. The existing capability and focus of each of these sources impacts the potential for FCDO investment to provide successful programme support in Timor-Leste.

A qualitative assessment of existing investment and potential opportunities in the fifteen key sectors from Timor-Leste's Strategic Development Plan 2011-2030 was undertaken. It identified social capital, infrastructure development and economic development opportunities and highlighted funding gaps from broader multilateral and bilateral Official Development Assistance finance and private finance. In addition, governance was also assessed as it supports the overall delivery of other sectors. The qualitative assessment was based on a desktop assessment of available public documents and data sources which outlined key projects, loan terms and alignment with climate-targeted financing.

The three-part assessment undertaken was made up of:

- Part 1 - State of play: Global and Southeast Asian key trends in climate resilience financing, including challenges. This outlines the flow of financing in multilateral, public and private sector financing. Multilateral and private financing details focus on the Southeast Asian context and the current funding and financing challenges apparent in the region. Public financing and its role in Timor-Leste are assessed in further detail, given increasing reliance on public expenditures.
- Part 2 - Stakeholder engagement: Outcomes from stakeholder engagement and key findings.
- Part 3 - Priority sector financing in Timor-Leste: Key projects, investments and trends per sector. This provides an assessment of FCDO potential in each sector using a multi-criteria assessment.

Focus areas and projects encompassed under this reports definition of climate financing include:

- Climate mitigation projects
- Climate adaption projects
- Financial market flows and activity including bank loans, green financing, sustainable financing and low carbon financing for the purposes of addressing climate change effects
- Links to climate change were extensively discussed in project documentation

It is key to note that given there is limited distinction in project definition between whether funding or financing is being directed towards mitigation or adaption, both were looked at in combination.

2.4.2 Summary

The priority sector assessment of suitability (Part 3) for FCDO investment has been based on three key criteria. As noted above, this is based on expert opinion and the information available. Based on the desktop review, these factors were seen as the differentiating factor between each sector. The three criteria selected, and their justification is outlined below:

1. FCDO can value add in the sector – to highlight whether there is a need for additional support / technical assistance in the sector, or the private or public sector can solve for climate resilience and adaption themselves.
2. Requires additional funding – to highlight if it is a high or low funded sector compared to others.
3. Support required to improve access to funding/financing – given many climate projects are driven by Government due to complexity or lower returns, highlights whether support is required to access to markets or financing.

The following tables outline the definition for each of the criteria used to assess the options, as well as the rating tool applied.

Table 2-6: Criteria definition

Criteria	Definition
FCDO can value add in the sector	The extent FCDO has an opportunity to add value in the sector through non-financial / monetary means. Requirement for technical assistance. Includes regulatory frameworks required to support the Government drive climate resilient projects, and/or building capability in the sector. The need for FCDO to create private sector or public awareness.
Requires additional funding	Whether there is already sufficient public, private or multilateral financing in the sector based on the relative funding to other sectors.
Support required to improve access to funding / financing	The extent that FCDO could support with financial or funding interventions, such as providing financing to Government or help Government broker deals or tap into private sector investment.

Table 2-7: Ratings for each criteria

Rating	Definition
Low priority	Low priority for FCDO focus Low likelihood of success Low urgency High complexity to resolve.
Possible	Medium priority for FCDO focus Low – medium likelihood of success Some urgency Medium complexity to resolve.
Explore further	High priority for FCDO focus Medium – High likelihood of success High urgency Low complexity to resolve

Limitations

- In our review we identified 293 projects either linked or directly supporting climate resilience initiatives. Using the OECD data to show on the level of climate related investment compared to all of sector investment, there was some misalignment between the priority sectors definitions as per this this document. Where this has occurred, this has been highlighted in the following pages.
- There was limited distinction in project definitions on funding and financing directed towards mitigation or adaption, as such they have been looked at in combination.
- Examples of priority sector financing were identified from the following literature and databases. There is likely to be more data and projects available for each sector.
 - UNDP Climate Public Expenditure and Institutional Review (CPEIR) 2022
 - World Bank Data Bank
 - Asian Development Bank Projects and Tenders Database
 - OECD iLibrary

- IJGlobal database
- Desktop research
- Evaluation against these criteria is based on desktop review only, and has been qualified in the rational and key findings. Further research to assess the potential for FCDO to engage in each sector is recommended.

2.4.3 Key conclusions

There are a number of sectors that present clear opportunities for FCDO to engage, based on the assessment of current funding; ability of government to access additional funding; and the potential for FCDO to add value. Education, environment, social inclusion and equity, and water and sanitation are all sectors that are recommended for further exploration, based on potential for impact, urgency, level of complexity and priority. Other sectors, like rural development, tourism and private sector potential sectors, were selected as potential options, benefitting from additional targeted interventions to ensure that the sector is adequately prepared for the impacts of climate change.

The ability of the government to access additional financing and clearly link that financing to climate change resilience emerged as a weakness in a range of sectors, and could be a targeted area of focus to ensure that the government can access, manage and distribute funds. With improved capability in this area, the government would also be able to better access private finance or MDB effort. Appropriate regulatory and policy frameworks would also facilitate access to finance, as discussed in more detail in the next section.

The following table summarises the findings of the multi-criteria assessment (MCA), including the criteria and ratings applied.

Table 2-8: Findings on key sectors measured through assessment criteria

Sector	Summary	FCDO can value add in the sector	Requires additional funding	Support required to improve access to funding/financing
Education	There is insufficient public awareness and understanding of the education sector's vulnerability to climate change, and as such there is little funding to support activities around climate adaptation or mitigation in the sector. FCDO could support through technical assistance to improve understanding of the impact of climate change on the sector, and provide financing for targeted activities through MDBs or other on the ground NGOs.	FCO can raise awareness with key stakeholders and potential funders of the link between climate change and education, particularly around natural disasters and increased public financing.	Low expenditure compared to other sectors, and very limited funding targeted for climate change activities. The sector has inconsistent annual spending.	This sector is reliant on government funding, supplemented by MDBs and supported NGOs. This sector could benefit from financing by FCDO.
Electricity	Despite relatively high investment in the sector, electricity continues to require investment, particularly in regional areas. FCDO can support through exploring blended finance models in the sector.	Although the sector already has funding and financing, FCDO can support through technical assistance in the delivery and implementation of new renewable energy projects. The FCDO can provide support to ensure the existing funding flows are efficiently targeted to renewable energy projects.	Sector is relatively well-funded in comparison with other sectors. However, opportunity exists for further investment in renewable energy sources.	Given energy is a sector with global experience in blended finance models, FCDO could leverage this and participate, particularly in renewable energy.
Environment	Environment is a sector with strong Government policies, however these policies are poorly resourced by government. There is also limited awareness of potential opportunities for the private sector to engage. FCDO could improve this awareness or support access to various MDBs.	FCDO can help raise private sector awareness of the opportunities for investment in the sector. FCDO can also provide technical assistance to support programs in this sector.	Lack of significant funding compared to other sectors.	Although there is some capability in the sector, shown through existing Government policy, improved funding could be beneficial for technology and tourism-linked projects. FCDO could also support access to various MDB grants or loans for specific climate-resilient programs.

Sector	Summary	FCDO can value add in the sector	Requires additional funding	Support required to improve access to funding/financing
Social inclusion and gender equity	Given the importance of the sector and interrelationship with other sectors, FCDO can support and assist in developing improved climate mitigation and adaption measures, moving away from reactive grant funding structures to targeted and collaborative funding schemes, collaborative funding with public and private finance institutions and capacity building as well as outcome-based grants.	The Social Inclusion and Gender Equity sector is particularly affected by climate change and should receive targeted focus in disaster recovery and recovery efforts. There is an opportunity to FCDO to support the development of improved adaption measures, acknowledge the specific challenges faced by different groups and communities and seek to address these disparities in disaster management and recovery processes, as well as through improved preparation.	Lack of significant funding compared to other sectors.	With funding available on grant basis with little Government influence due to the responsive nature of most investment, FCDO could create opportunities to move towards adaptation and preparation, and away from reactive measures, particularly as this sector is interrelated with several others.
Water and sanitation	FCDO can play a role in providing technical assistance to help discover and create awareness of the strong links the sector has to climate resilience. It can also top Government funded initiatives to support projects that are short on funding.	Given that MDBS primarily fund medium sized projects, FCDO can assist in providing technical assistance and support the delivery and implementation of smaller climate mitigation and adaption projects in the sector. This is particularly important for projects with strong links to climate resilience.	With some funding available, particularly in medium sized projects, funding required is not as substantial as other sectors, but there is still a potential funding opportunity for smaller projects.	With limited policy declarations and focus, FCDO could help attract further funding, or work with MDBs, NGOs or other private sector bodies. FCDO could top up Government funded programs in water and sanitation to realise marginal projects that are otherwise short on funding.
Rural development	The sector has strong alignment to several others. With insufficient MDB funding, FCDO could top up Government funded programs to realise marginal projects that are otherwise short on funding.	The sector has strong links to others, including agriculture, tourism, water and sanitation, which also have insufficient funding. FCDO can support in providing technical assistance in developing policy that contributes to climate-responsive rural development.	Insufficient funding, magnified by insufficient funding to related sectors (agriculture, social inclusion).	Given the limited opportunities for commercially viable funding for the private sector, FCDO could support Government through financing intermediary parties including development banks, microfinance institutions and impact investment funds to de-risk projects that might not otherwise be viable. FCDO could top up Government funded programs to realise marginal projects that are otherwise short on funding.
Tourism	With potential for Timor-Leste to tap into various MDB grants or loans for specific climate-resilient program for tourism assets, FCDO could support Government access these funds, or provide marketing assistance.	FCDO could support creating awareness in climate sensitive tourism. This could be through technical assistance to support businesses create eco-tourism opportunities or support to increase marketing efforts.	Insufficient funding, magnified by insufficient funding to related sectors (environment).	Sector has the capability to develop commercially viable investments. FCDO could provide business grants that upgrade existing assets or protect natural tourism assets that lead to tourism potential.

Sector	Summary	FCDO can value add in the sector	Requires additional funding	Support required to improve access to funding/financing
Cultural heritage	With difficult market entry, given its localized nature, MDBs have not invested strongly in the sector. FCDO could provide support in the form of technical assistance to promote an increased understanding of the links between climate change and cultural heritage.	Currently, MDBs and private sector do not enter the market given it is a specialized local sector. FCDO could provide technical assistance that supports the development of localized research on the links between climate change and cultural heritage, particularly around incorporating traditional knowledge into activities.	No funding available for the sector.	Currently, Government has no clear capability in accessing funding/financing in the sector, FCDO may be able to provide direct funding into the sector.
Governance	Governance plays a key role in a number of other sectors, as such FCDO can provide either technical assistance or direct funding for leadership and capability development.	With limited scope for the private sector to value add to governance sector, FCDO can provide technical assistance.	Insufficient funding available on national level.	Opportunity for FCDO to provide funding for MDBs to provide capability development and support leadership capabilities.
Roads and bridges	The sector is quite mature, with funding already available from a number of sources. There may be some opportunities for technical assistance through design for disaster resilience.	There are a variety of projects funded (roads, public transport), although there is an opportunity for technical assistance to support flood resilience through design, and integration of climate-and disaster resilience into construction.	Funding available via public financing, private financing, and multilateral banks.	Mature sector, with numerous projects, and few bankable investment opportunities.
Sea and airports	FCDO could support Government in integrating climate change impacts into policy documents or fund climate related aspects of projects delivered by the private sector.	Given ability to generate revenues into the sector, there is smaller necessity for FCDO to intervene. However, these solutions often lack innovation. In addition to this, FCDO could support Government in integrating climate change impacts into policy documents.	Sufficient both private and public sector investment compared to other sectors, with recent investment into Presidente Nicolau Lobato International Airport.	Given there are strong revenue lines and potential private sector appetite, FCDO could support the climate related aspects of projects through funding if delivered by the private sector.
Health	Given there are already healthy levels of MDB and public funding and investment in the sector, the FCDO could support technical assistance that develops climate resilient infrastructure, or funding towards climate linked projects identified in the Health National Adaption Plan.	With the link between climate change and health explicitly demonstrated in most projects and therefore market response, FCDO can add value through further investment in the sector, and technical assistance to develop climate resilient health infrastructure.	Although the sector receives a relatively high amount of funding, the high burden of poor health and its interrelationship with other sectors means that further funding is required.	FCDO could provide grant funding for climate resilient health infrastructure which has been identified in the Health National Adaption Plan.

Sector	Summary	FCDO can value add in the sector	Requires additional funding	Support required to improve access to funding/financing
Private Sector	Although it requires more Government focus, FCDO could provide technical assistance to increase training or create private sector led PPPs, delivered through MDBs. However unclear definition suggests this is a lower priority sector.	There is a lack of Government focus or interest, resulting in insufficient policy, which FCDO could provide technical assistance. FCDO could also support attracting investors, and creating opportunities for growing businesses or start-ups.	Lack of significant funding compared to other sectors.	Sector lacks maturity and the training required for efficient deal structuring, investment attraction. There could be an opportunity for private sector led PPPs, supported by FCDO, delivered through MDBs.
Petroleum	With the sector reducing in attractiveness, and potential decline in reserves, FCDO can support Timor-Leste in developing policy towards transition, however without this, there is a reduced likelihood of investment attraction.	Given the clear gaps in the way sector addresses climate change adaptation, FCDO can provide technical assistance in supporting the transition, particularly in reducing the risk of reserve depletion and the financial impact.	The sector has some funding available; however declining bankable investments from the private sector.	With urgent action required to reduce reliance of the petroleum revenue, and lack of clear links to climate mitigation or adaption, funding could be provided by FCDO to MDBs, or through the provision of access to climate funds. However, without stronger policy around transition to green fuel sources, interest in the sector could be challenging.
Agriculture	Although the sector has a reasonable level of investment compared to others, FCDO has an opportunity to provide technical assistance, or attract carbon credit and offset projects.	The sector is primarily funded by publicly financed projects and attracts relatively lower degrees of funding from private funding. The Agriculture sector is also supported by some multilateral partners. FCDO could provide technical assistance, create governance structures or create market awareness in the growing availability of bankable investments in the sector.	Funding gap is still present, even though the sector receives significant funding in comparison with other sectors.	FCDO could help attract or support creating carbon credit projects. They could also find partners for climate resilient agriculture projects with local farmers.
Telecommunications	The sector is lower priority, with already strong public investment in the sector. FCDO could broker deals or create partnerships in the sector or provide technical assistance for climate policy integration.	Given there are already innovative solutions in the sector through public funding, MDB funding, and some private investment, this sector is a lower priority for FCDO. However, FCDO could support the integration of climate mitigation and adaption into policy documents.	Sufficient funding available in comparison with other sectors.	Public allocation to the sector is strong, however there remains a potential for stronger private sector links. FCDO could create relationships with the private sector, support potential bond issuance, or access to climate funds.

LEGEND Low priority Possible Explore further

3. Catalysts and constraints

3.1 Catalysts and constraints for climate adaptation

3.1.1 Approach

The main catalysts and constraints to effective climate action were assessed as part of an analysis of the political economy around climate change in Timor-Leste. This provides an understanding of the enabling environment and potential risks and constraints for effectively deploying UK technical and financial assistance, which has informed our final proposals to FCDO in Section 4 of this report. This review was informed by the same literature, internal and external consultations as the analysis of the legal, financial and institutional arrangements. Insights from stakeholder consultations with representatives from relevant government entities are especially referenced in this section to evidence our findings from desk-based research.

The catalysts and constraints were identified across eight critical enablers for climate resilience. These eight enablers were drawn from Arup's Climate Resilient Infrastructure framework (C.R.In) and are based on proposals by the Institute of Civil Engineer's Enabling Better Infrastructure: 12 Guiding Principles for Prioritising and Planning Infrastructure report published in 2019 and the OECD's Climate Resilient Infrastructure: Policy Perspectives report published in 2018. This framework was selected to frame our analysis as it was found to be more holistic than other political economy analysis tools, and allows for more comprehensive consideration of key factors in the types of projects and programs expected to result from this study. Other tools like the World Bank's Climate Change Institutional Assessment or Jakob et al.'s Framework of the Political Economy of Energy and Climate Policy applied to India, Indonesia and Vietnam each only focus on one of the eight enablers that the C.R.In framework covers. Arup has used the framework on another UK FCDO study in the Philippines, which demonstrated its usefulness in unpacking key issues in programme delivery in a development context.

3.1.2 Summary

The eight enablers are presented below, together with the score definitions. The scorings are based on best practice definitions, with 1 being furthest from best practice and 3 being closest to best practice. Arup has updated the best practice definitions to be applicable to all sectors more broadly, not just infrastructure. Table 3-1 below provides an overview of the definitions with further details provided in Work Package 2.

Table 3-1: Overview of eight critical enablers from Arup's C.R.In framework with definitions applicable to all sectors

Enablers and main criteria	Scoring – 1 (furthest from best practice)	Scoring – 2	Scoring – 3 (closest to best practice)
Institutional architecture Cooperation Decision-making Responsibilities	Minimal Limited to few ministries and resilience not a priority Unidentified or unclear	Could be more effective Collective and resilience sometimes informs planning and budgeting at all levels Clearly identified but not fully accountable	Effective Collective and shared priority and resilience systematically informs Clearly identified and fully held accountable
Legal and regulatory frameworks Frameworks Enables climate finance Use of data	No strong legal mandate Needs strengthening to create private sector finance market Not informed by latest data	Links to climate change Good environment, but not mobilised to full potential Informed by latest data, but not adapted to local context	Climate change focused frameworks Frameworks integrate resilience and attracts climate finance Informed by latest data that is adapted to local context

Enablers and main criteria	Scoring – 1 (furthest from best practice)	Scoring – 2	Scoring – 3 (closest to best practice)
Policy, planning and strategic environment Policy coherence Coordination Infrastructure planning	Fragmented policy goals Not well-coordinated Infrastructure-related frameworks, plans and masterplans not informed by climate goals	Some overlapping climate policy goals Good coordination across administrative boundaries, but not across sectors or vice versa Sometimes informed by climate goals	Consolidated policy goals Good coordination Infrastructure-related frameworks, plans and masterplans systematically informed by climate goals
Technology uptake, affordability and private-sector financing Life cycle and total value Financial feasibility	Focus on capital costs with minimal considerations for operational costs Limited investments in new technologies and risk sharing remains a challenge	Does not focus solely on capital costs, a life cycle or total value approach sometimes taken Few investments to-date	Life cycle and total value approach is consistently taken Significant investments and investment risks are shared with private sector
Data and information Up-to-date Accessibility Cross-sectoral	Outdated climate data and science Data is difficult to access by relevant government entities Incoherent planning and budgeting as data availability and quality is inconsistent	Partially up-to-date climate data and science Data is accessed by some, but not all Poor availability and quality of data for some sectors	Up-to-date climate data and science Data is easily accessed and informs decision-making Coherent planning and budgeting due to consistent data
Stakeholder engagement Collaboration Communication	Minimal collaboration between diverse stakeholders Limited communication and engagement between levels of government	Some collaboration between diverse stakeholders Good communication and engagement between levels of government	Effective collaboration between diverse stakeholders Strong communication and engagement between levels of government
Human capacity and uptake capability Skills Institutional Technology uptake	Limited human capital, skills gaps due to insufficient capacity support Government entities do not have capacity to enforce and embed climate considerations Existing technologies are not known, and new technologies are not supported	Decent human capital, some skills gaps despite capacity support Government entities at some levels do not have capacity Existing technologies are new to industry, and some new technologies are supported by industry plans	Sufficient human capital, with strong capacity support Government entities at all levels have capacity Existing technologies are mastered by industry, and new technologies are supported by industry plans
Financial governance Understanding climate risk disclosure Mechanisms Budget alignment	Financial governance bodies not aware of climate risks Tools to assess and disclose climate risks not available. Minimal availability of financial mechanisms Municipal budget not aligned to climate strategies	Financial governance bodies have some awareness Tools are available but not widely used. Limited number of financial mechanisms, though present Municipal budget sometimes aligned to climate strategies	Financial governance bodies understand and govern it Tools are available and widely used. Innovative financial mechanisms are available Municipal budget systematically aligned to climate strategies

A semi-quantitative, high-level assessment of the current enabling environment for climate resilience across the eight enabling factors is provided in

Figure 3 below. Each factor has been assigned a 1-3 scoring, with 1 being furthest to best practice and 3 being closest to best practice. It should be noted that the scores indicate that factor's overall performance, taking into consideration the current enablers that are closest to best practice (catalysts) and evident gaps or observed shortcomings that are furthest to best practice (constraints). The catalysts and constraints were first summarised qualitatively, then scores for each factor were assigned based on overall impression of performance meaning the relative number of catalysts to constraints, their relative significance, and informed by an understanding from our in-country consultants of the political economy outside of climate change.

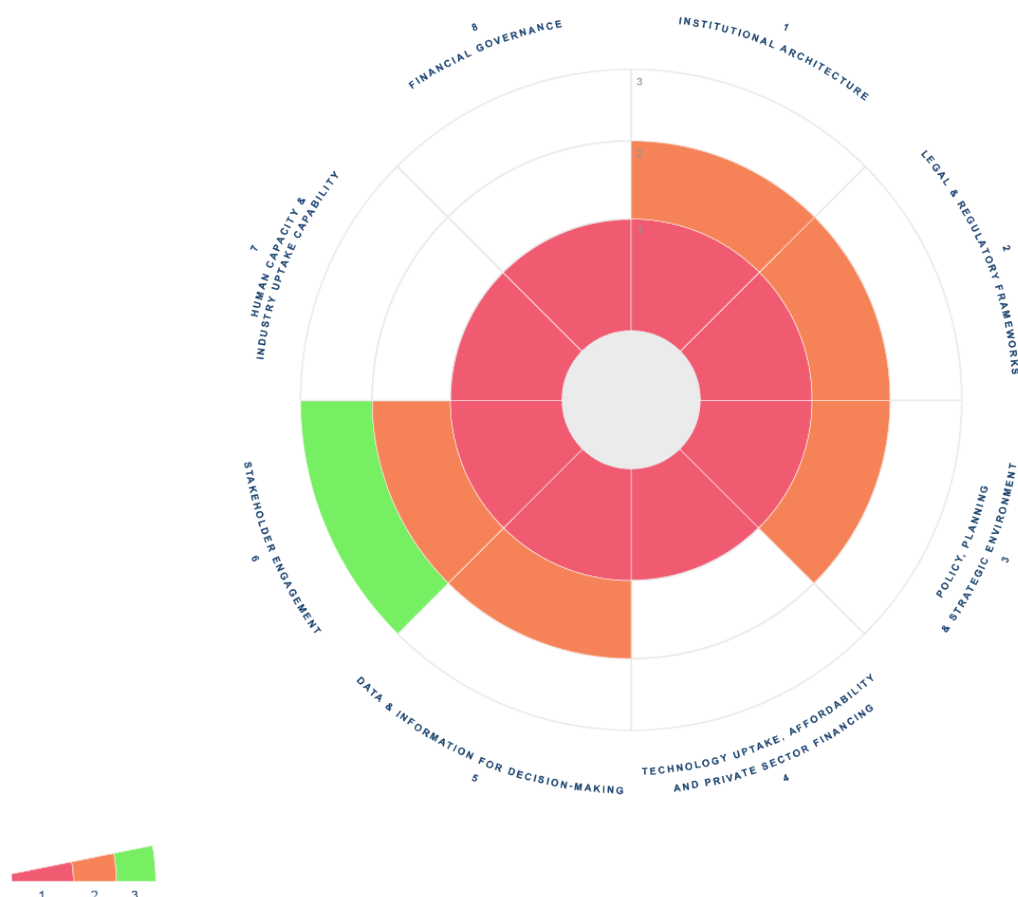


Figure 3: Assessment of the enabling framework for climate resilience in the Timor-Leste

Progress has been made in some areas and further support is required in other areas. The existing catalysts and constraints that form the basis of this assessment have been elaborated below.

3.1.3 Key conclusions

The catalysts reflect enablers that Timor-Leste is excelling in or has recently adopted to drive change; these should be celebrated and built upon. The constraints represent evident gaps or observed shortcomings related to climate resilience in Timor-Leste. The constraints represent key opportunities for change.

Institutional architecture

The government has put in place the formal institutional arrangements to support its response to climate change, and does have some access to financial support to support these arrangements at the national, municipal and suco (village) levels.

While the institutional arrangements have been put in place, there is still work required to strengthen the coordination that adaptation will require and to ensure that ministries have a clear understanding of roles and responsibilities.

Legal and regulatory frameworks

Many of the legal and regulatory frameworks in Timor-Leste make reference to climate change, including the National Constitution, the Environmental Basic Law, and Decree-Law 6/2020 instituting the legal regime for the protection and conservation of biodiversity. The government is also working on an innovative climate change focussed Decree-Law which will provide the legal framework for the country's climate change response.

Despite these frameworks, there are still a number of areas where there are no requirements, or where enforcement mechanisms are lacking. For instance, there is no requirement for key stakeholder ministries to assess and address climate-related infrastructure risks. There remains a gap overall around legal and regulatory enforcement mechanisms that would give weight to the existing legal frameworks.

Policy, planning and strategic environment

The Government of Timor-Leste has developed a number of very comprehensive and holistic strategies and policies to respond to climate change impacts. These include the NCCP Policy, published in 2021, which is the central policy framework for guiding the country's national approach to climate action. The 2021 NAP provides the strategic basis for national adaptation priorities and implementation arrangements in Timor-Leste. Supporting this, is an unconditional commitment to operationalise the plan in the updated NDC.

Despite these comprehensive strategies, the corresponding implementing ministries have not mainstreamed climate change into their sectoral policies. Stakeholder consultations revealed a need to translate high-level adaptation priorities into sectoral plans and strategies as MOH had done to develop H-NAP.

Technology uptake, affordability and private-sector financing (including access to green finance)

An Integrated National Financing Framework (INFF) has been developed to support the Government in developing financing mechanisms for national sustainable development, with climate financing identified as a priority area. The government is also developing a Blue Economy Financing Roadmap, which will help to identify innovative financing options in the blue economy that could contribute to climate adaptation and resilience.

These initiatives represent a strong interest on the part of the government in accessing climate finance to support sustainable, diversified economic growth that can help offset declining oil and gas revenues. However, access to private-sector financing remains limited in many areas, which is a key limitation in Timor-Leste's ability to deliver on its development goals.

Data and information

There has been significant investment in developing data and information to inform climate adaptation action in Timor-Leste, including a USD 21.7 million project will establish end-to-end climate information services and multi-hazard early warning systems. Vulnerability and risk assessments have also been used to inform the NAP, and the intention is to develop more detailed assessments in order to update the plan. Data gaps remain, particularly around economic losses caused by climate change. There is a need to develop more of an evidence base around climate risks and vulnerability at a more granular scale and the potential economic cost caused by climate-induced impacts.

Stakeholder engagement

The NCCP identifies informed and effective participation as one of the seven guiding principles, which means that stakeholder engagement must be considered in the development of future national and sectoral climate policies. The development of the NCCP itself involved a series of consultations involving different ministries and other stakeholders from the Climate Change Working Group. There are also opportunities to involve local communities in resilience building efforts through strengthened engagement based on Tara Bandu, a Timorese custom that can be used to enforce resilience and conservation strategies agreed by the community.

Human capacity and uptake capability

While Timor-Leste has made significant development progress over the last two decades, including building institutional and human capacity, continued and sustained efforts are required in order to support the prioritisation, budget allocation and utilisation for, and implementation of climate programmes and projects.

Conversations with stakeholders revealed a need for support to civil servants around sectoral policymaking, embedding climate considerations in processes, and managing programmes and projects, as well as professionals who may require specialised training for certain adaptation initiatives.

Financial governance

Over the years, the Timor-Leste Government has made a sustained effort to reform financial governance with support from international organisations, which has allowed it to access more international funding. The government of Timor-Leste has two main public funds available, the Consolidated Fund of Timor-Leste (CF-TL) and the Infrastructure Fund, for funding climate-related projects. In addition, grants are available through the GCF for the development and implementation of key climate strategies and plans.

Despite the improved financial governance, priority programmes and projects from the NAP have not yet been integrated into budgetary planning. At the same time, budgets allocated for climate-related projects and programmes are under-utilised. Some of this is likely due to the reactive nature of financial support for climate resilient infrastructure which is put towards response to specific climate-induced events rather than towards building climate resilience.

4. Proposals for FCDO

4.1 Overview

Based on the analysis undertaken in Work Packages 1, 2, and 3, six sectors have been prioritised for the UK to provide technical and financial assistance to improve resilience to climate change. These sectors include:

- Environment
- Social Inclusion and Gender Equity
- Water and Sanitation
- Health
- Education
- Roads and Bridges.

The Timor-Leste government has identified a suite of sector-specific and cross-cutting climate adaptation initiatives in the National Adaptation Plan (NAP), the Post Disaster Needs Assessment (PDNA), and the preliminary Integrated Vulnerability Assessments (IVA). These documents are nationally led and incorporate coordinated post-disaster principles. In particular, the NAP is the central guiding document for Timor-Leste with the expectation that each ministry adopts and delivers their own respective initiatives. There is a significant opportunity for Official Development Aid (ODA) to be directed towards supporting the implementation of these initiatives.

This section sets out a suite of proposed activities to be undertaken by FCDO to deliver impact and support climate resilient development in Timor-Leste, based on the initiatives already identified by the government and grounded in global best practice. These proposed activities are focussed on the priority sectors identified in this study and are grouped across five key themes:

1. Build human and institutional capacities to prepare for climate-related shocks and stresses
2. Integrate climate strategies into ministry lines and procurement policies at the national and sectoral levels
3. Empower communities to adopt and implement climate-resilient practices
4. Build new/ retrofit existing water infrastructure for climate resilience
5. Support government to strengthen evidence base through data collection and processing

For each theme, enablers and conditions of success are outlined along with the risks and constraints for action implementation. These are based on the findings from Work Package 2, stakeholder engagement interviews, and implementation principles from the PDNA [8]. Proposed activities for FCDO have been screened to ensure alignment with the UK's strategic priorities and capabilities for international development, as defined in the UK International Development Strategy, Integrated Review, and Indo-Pacific Climate Pillar.

The nominated time horizons outlined in the roadmap of proposed activities correspond with the government endorsed actions from the NAP, PDNA, and IVA. These timeframes are not suggested as implementation targets for the proposed FCDO activities, however, there may be an opportunity for FCDO to meaningfully input into these planned government actions if timeframes are adequately aligned.

The nominated ministries provide direction for FCDO to engage with Timor-Leste government.

4.2 Roadmap of proposed activities

4.2.1 Theme 1 – Build human and institutional capacities to prepare for climate-related shocks and stresses

Priority sectors in Timor-Leste are highly dependent on environmental ecosystem services, yet there is a lack of capability and understanding of how climate change will impact the quality and availability of these services in the future. Building human and institutional capacity to map, respond, and prepare for climate-related shocks and stresses to the environment will build resilience across sectors and communities.

Additionally, climate change and its impact on ecosystem services will disproportionately impact vulnerable groups including traditional leaders, youth, women, veterans and persons with disability by further impeding easy access to essential services, employment and diverse and inclusive decision-making processes. Human and institutional mechanisms to ensure equitable outcomes in decision-making and infrastructure planning are lacking. Alongside better environmental management practices across sectors, there is a greater need for improved engagement and opportunities for diverse communities and groups, which links to the social inclusion and gender equity agenda.

Key sectors:

- Environment
- Social Inclusion and Gender Equity

Enablers and conditions of success:

- Strong political and institutional commitment to deliver on climate adaptation and resilience
- Equal participation and leadership of women in recovery and resilience
- Use of local resources and expertise in combination with learning and practices from other countries

Risks and constraints

- Need adequate engagement from key ministries and at multiple levels within those ministries in order to build capacity at institutional level
- Capacity is uneven across ministries which may result in uneven investment

Table 4-1: Table of Activities for FCDO – Theme 1

FCDO Activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Promote implementation of nature-based solutions for climate adaptation in terrestrial and marine ecosystems using holistic cost-benefit analysis, drawing upon global best practice.	Identification of biodiversity in terrestrial and marine ecosystems, cost-benefit analysis of climate change related problems facing them, and socio-economic benefits of sustainable natural resource management.	Short term (0-2 years)	Ministry for Environment Ministry for Agriculture and Fisheries Director General Forestry and Director General Fisheries
Provide global expertise and best practice in natural capital assessment to map the impact of climate change on ecosystem services and system dependencies on natural capital. This should complement and improve local capacity and expertise.	Preparation of a climate risk and climate sensitive land use, biodiversity and natural resource management plan.	Medium term (2-5 years)	Ministry of Agriculture and Fisheries Ministry for Forestry Ministry for Environment
Develop an economic transition plan to expand and diversify employment in sustainable fisheries and marine ecosystems industries.	Develop alternative livelihood options to enhance community resilience through fisheries and marine ecosystem-based bio-physical resources.		

FCDO Activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Undertake consultation and assessment of past projects to understand previous barriers to entry for country-level integration of ecosystem management services.	Decide on the country appropriate level and approach of ecosystem management options such as integrated watershed management, landscape level, ecosystem-based approach and implement the ecosystem management approach for sound management of natural resources and biodiversity		
Work with local experts in social inclusion and gender studies to integrate community perspectives and Tara Bandu in long-term climate resilience solutions.	Engagement with traditional leaders, youth, women, veterans, persons with disability and LGBTQ in all stages of the project cycle – from the design phase to the implementation phase and the monitoring of various activities. ²		
Provide global expertise and long-term consultation on ecologically sustainable development to enhance greater local ownership and community management for economic opportunity, such as carbon credits or forestry products.	Collaborate to promote afforestation and reforestation programmes in the most disaster-prone and degraded areas	Long-term (5+ years)	Forestry Directorate Ministry of Agriculture and Fisheries Ministry of Environment Ministry for DRR(Secretary State of Civil Protection

4.2.2 Theme 2 – Integrate climate strategies into ministry lines and procurement policies at the national and sectoral levels

Climate change will have cascading impacts across and within sectors in Timor-Leste without coordinated and robust consideration of direct and indirect climate-related risks at a systems-scale. This is particularly relevant for decision-making in the environment, water and sanitation, and health sectors, for which siloed and piecemeal interventions can exacerbate vulnerabilities in other parts of the system. The integration of climate adaptation into ministerial and sectoral levels enables better visibility and consideration of the synergies and trade-offs of local and national action.

Key Sectors:

- Environment
- Water and sanitation
- Health

Enablers and Conditions of Success:

- Multi-sector, multi-stakeholder and multi-level cooperation and coordination by Government at all levels with the support of other international agencies, technical agencies, non-government organisations and local organisations
- Strong progress on financial governance to facilitate coordination and implementation of cross-sectoral initiatives

Risks and Constraints:

- Stakeholders are not required to assess and address climate-related infrastructure risks
- Financial support for climate resilient infrastructure tends to be reactive to specific climate events rather than preventative

² Ministro Coordenador Dos Assuntos Económicos (Mcae), Gabinete Secretaria De Estado Do(Gsea) Ambiente , “Timor-Leste Integrated Vulnerability Assessment (IVA) Report,” n.d.

- Some actions identified in the NAP to implement priority programmes and projects have not yet been integrated into budgetary planning
- Continued under-utilisation and loss of allocated budgets for climate-related programmes and projects if procurement is not managed properly

Table 4-2: Table of Activities for FCDO – Theme 2

FCDO activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Coordinate UK expertise on mapping health risks from climate change, including GIS expertise similar to the climate risk mapping for Greater London Authority analysing personal and social factors including health and income inequalities that increase vulnerability across London. ³	Preparation of Health Risk and Preparedness Map in relation to different climate risks, magnitude of existing and potential health risks due to each type of climate risk and existing and planned public health service delivery capacity at the national, sub-national and local levels.	Short term (0-2 years)	Ministry of Health
Work in close collaboration with national and subnational health service delivery units and Comprehensive Primary Health Care system which includes Family Health and SISCA to understand climate change interaction with health system response frameworks. This should include consideration of WASH priorities.	Establish surveillance and response mechanisms to deal with climate related public health issue. Integrate climate change adaptation and mitigation in health sector policies including WASH priorities.	Medium term (2-5 years)	Ministry of Health and Environment Ministry for Forestry Minister of Agriculture and Fisheries
Apply global frameworks and build capacity and mainstreaming around key certification programs for sustainable forestry. Support relevant Ministries to roll out standards and training on standards.	Develop standards for sustainable forest harvesting.		
Introduce international expertise from UN disaster response approaches to input into the development of a climate-sensitive health disaster management plan. There is an opportunity to draw on organizations such as UK Health Alliance on Climate Change.	Health cluster to prepare for and respond to emergency events and disasters.	Long-term (5+ years)	Ministry of Health Ministry for Environment Ministry of Agriculture and Fisheries
Share frameworks and approaches to support incorporation of community input and understand welfare concerns in the broader context of sustainable resource management.	Promote sustainable natural resource management and ecosystem management measures, including the ones that ensure welfare of the local communities, in national planning.		
Introduce legal expertise to understand best practice on legislative integration of existing and future climate-related policies relating to coastal ecosystems.	Protection and conservation of coastal ecosystems from sea level rise and other related climate change impacts, especially mangroves and coral reefs. Ensure climate change adaptation interventions are well integrated into the coastal and mangroves rehabilitation and protection policy instruments.		

4.2.3 Theme 3 – Empower communities to adopt and implement climate-resilient practices

Community-driven approaches to climate resilience whereby communities are empowered to enhance their adaptive capacity through undertaking their own recovery is an adaptation pathway relevant to most of the key sectors identified. However, several sectors are prioritised under this approach because of their direct linkages to physical safety and poverty reduction, which stand to be worsened from climate change stressors. Leveraging local knowledge, experience and relationships of the sectors identified within Theme 3 is necessary to ensure a tailored approach to deepening Timor-Leste climate resilience.

³ <https://data.london.gov.uk/dataset/climate-risk-mapping>

Key Sectors:

- Environment
- Water and sanitation
- Education
- Social inclusion and gender equity

Enablers and Conditions of Success:

- A people-centred approach that enables communities to undertake their own recovery, using local knowledge and skills and social networks is included in the NAP principles
- Tara Bandu practices can enable strong action at the community level to protect resources, and enforce climate-resilient practices

Risks and Constraints:

- Limited capability and resources available at the community level to implement climate-resilient practices
- Ability to reach communities to raise awareness and spend adequate time to build trust to develop plans

Table 4-3: Table of Activities for FCDO – Theme 3

FCDO Activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Support local agencies in providing education programs to communities on sustainable water management and create roadmap of existing resources available.	Dissemination of knowledge about proper water management and usage techniques, especially for the dry season.	Short term (0-2 years)	Ministry for Water Resource Management Minister of Agriculture and Fisheries
Provide specialist support and expertise for local Water Management Groups to undertake workshops and understand key stakeholder approaches to integrated watershed management. Opportunity to draw on experience with bilateral engagement between UK and Peru on Integrated Water Management.	Create new or strengthen existing Water Management Groups at the community level.	Medium term (2-5 years)	Ministry for Water Resource Management Ministry in charge of infrastructure Minister of Agriculture and Fisheries Ministry for Environment Forestry Directorate
Coordinate with agencies and relevant government ministries to deliver community training on sustainable water and forest resource management for households and small enterprise. Findings from consultation should input into the development of community-based guidelines.	Work to promote water conservation, protection of springs and recharge of the ground water sources through an integrated watershed management approach in collaboration with key stakeholders. Develop guidelines for community-based forest resource management to promote forest resources based sustainable small enterprises.		
Apply global frameworks to understand and minimise the adverse impacts of drought and enhance water management strategies for communities. This can be achieved through mainstreaming support for early warning systems, potentially similar to the Faming Early Warning System Network ⁴ in Africa, which is supported by USAID.	Enhance government and community strategies to respond to drought	Long-term (5+ years)	Ministry of Public Works Ministry of Agriculture and Fisheries Ministry for Environment

⁴ <https://fews.net/>

FCDO Activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Introduce social sector and strategic development expertise in capacity-building activities for communities on sustainable land management practices including financial management, resource management, and land conflict resolution. This should leverage Tara Bandu principles for effective local engagement.	Build strong linkages between up-stream and down-stream communities (i.e. Watershed Committees) to ensure equitable and adequate water sources are available to downstream communities too Adapt to climate change and enable sustainable land management through productive rural communities in Timor-Leste. Train local communities on provision of local varieties of tree seedlings, preparedness and mitigation activities, financial management, conservation and preservation of forest resources and conflict resolution. ⁵		
Provide financial support to establish community service centres including funding for the construction of physical infrastructure, equipment, and training programs. These centres will provide communities with disaster resilience and preparedness advice and increase community cohesion and inclusion. This should leverage Tara Bandu principles for effective local engagement.	Help establish community service centres to share the experiences and to create community self-help mechanisms.		

4.2.4 Theme 4 – Build new or retrofit existing water infrastructure for climate resilience

Vulnerability to water insecurity is significant in Timor-Leste because of the population's heavy dependence on ecosystem services for their livelihoods. Moreover, inadequate infrastructure and capacity to manage water resources services has caused low-quality water management capability and high vulnerability to climate change. Thus, there is increasing need to enhance existing water infrastructure design to ensure and strengthen water security and protect interdependent sectors, including the environment. There is an opportunity to focus on a key vulnerability in Timor-Leste, with multiple interdependencies to leverage impact from investment in one sector to have a broad impact.

Key Sectors:

- Environment
- Water and sanitation
- Roads and bridges

Enablers and Conditions of Success:

- Using local resources and expertise in addition to drawing upon global best practice
- Promoting change and innovations at suco and national level

Risks and Constraints:

- Lack of resourcing, technical knowledge and coordination across multiple levels of government
- Insufficient data available to prioritise investment decisions

⁵ Ministro Coordenador Dos Assuntos Económicos (Mcae), Gabinete Secretaria De Estado Do(Gsea) Ambiente , “Timor-Leste Integrated Vulnerability Assessment (IVA) Report,” n.d.

Table 4-4: Table of Activities for FCDO – Theme 4

FCDO activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Collaborate with international partners including Engineers without Borders and Plan International to introduce global experts, best practice resilience frameworks, and case studies to build local capacity and assist in review of existing laws and regulations for water and sanitation infrastructure resilience in Timor-Leste.	Review existing laws, regulation and standards to enhance climate change resilience of critical infrastructure	Short term (0-2 years)	Minister of Public Works Ministry of Transport and Communication
Create roadmap of community-based initiatives such as investment in water storage tanks and water harvesting in areas with high vulnerability to changing water supply, to enhance local preparedness. Identify financing avenues to support implementation and uptake of initiatives. Provide expertise and strategies for mainstreaming best practice sustainable water management techniques to local community agencies.	Promote techniques of conserving water such as water storage tanks, water harvesting, and irrigation farm ponds among others to collect and store water during wet season and use during dry season.	Medium term (2-5 years)	Ministry of Public Works Ministry for Water Minister for Agriculture and Fisheries
Collaborate with international partners including Engineers without Borders and Plan international to provide experience and best practice guidance on resilient water infrastructure planning and design.	Improve physical infrastructure and natural vegetation methods to prevent landslides in hill sites, roads and river banks that are made vulnerable by climate change.		
Coordinate technical water experts to facilitate the development of technologies and mainstreaming of sustainable water infrastructure in collaboration with relevant agencies, institutions, and ministries.	Climate proof and environmentally sustainable infrastructure to protect water resources, including enhancing water harvesting, distribution and management systems.	Long-term (5+ years)	Ministry of Public Works Minister for Agriculture and Fisheries Ministry in Water Build Ministry for Environment Ministry for Water Resource Mgt
Provide support to forecast and account for long-term demand in water resources to support decision-making, infrastructure planning and transformational change.	Develop integrated watershed management, including integrated water resource management approaches. Design a water management system that includes assessment of demand projections and sustainable supply systems disaggregated by end use, and existing status of the water sources and supply systems.		
Facilitate partnerships with MDBs, Engineers without Borders, and Plan International to undertake research on appropriate technologies for water management in Timor-Leste, including rainfall harvesting.	Research and development of technologies more adaptive to climate change, particularly for key sectors (i.e. water resource and coastal/marine). Improvement of water management including developing and utilization of rainfall harvesting technologies particularly in high prone drought areas.		

4.2.5 Theme 5 – Support government to strengthen evidence base through data collection and processing

Data has a critical role to play in providing insights on the drivers and impacts of climate change in Timor-Leste as well as the performance of critical infrastructure and services in the face of natural disasters. In particular, there is a need for improved data on ecosystems and healthcare services where there are currently significant gaps in records and monitoring networks. Enhancing capacity to collect, process, and utilise data will enable greater understanding of climate change pressures and improve the capacities of institutions to respond through early warning systems and disaster preparedness.

Key Sectors:

- Health
- Environment
- Water and Sanitation

Enablers and Conditions of Success:

- Strong existing evidence base of vulnerability and risk assessment
- Commitment to improving evidence base highlighted in key strategies

Risks and Constraints:

- Data on economic loss caused by climate change is not being collected and shared, which may result in a lack of coordination between ministries and poor prioritisation of investment
- Limited capability of Timorese in key areas including GIS, climate science, down-scaling climate models

Table 4-5: Table of Activities for FCDO – Theme 5

FCDO activities	Government endorsed actions	Nominated time horizon	Nominated ministries in NAP
Coordinate data specialists to work in cross-disciplinary teams with health experts to assist in development of the health database and data management systems.	Support the development of health database and data management systems which includes climate sensitive health risk and vulnerability information to facilitate effective, targeted and efficient delivery of health service.	Short term (0-2 years)	Ministry of Health Ministry of Agriculture and Fisheries Ministry of Education Ministry in-charge of Economy and Development
Collaborate with global ecological and climate resilience experts to understand eco-sequestration and ecosystem services potential across Timor-Leste.	Research to identify the tree species which contribute to enhanced carbon sequestration, better water retention capacities and better erosion reduction/ slope stabilizing capacity. Research to identify water-borne or vector-borne diseases related to increase in temperature and rainfall.		
Identify data needs and facilitate training and mentoring to support the government establish holistic economic valuation approaches for natural capital.	Launch studies on economic valuation, cost-benefit analysis and loss and damage to assess the existing ecosystem services and programmes to enhance the ecosystem further.		
Work with local water utilities to better understand and monitor water demand and sustainable supply using data and predictive analytics.	Collaborate with other entities to assess demand projection and sustainable supply systems disaggregated by end use, and existing status of the water sources and supply systems.	Medium term (2-5 years)	Ministry of Health Ministry for Water Resource Management Ministry in charge of infrastructure
Collaborate MDBs to help set up robust systems to monitor and detect climate-related health risks. This can include training health workers and strengthening existing health systems to enable effective and timely responses to emerging health threats.	Establish surveillance for health early warning systems and response mechanisms for climate-related health risks.		
Continue to collaborate with local and international experts on technological development in the environment sector to enable transformational change in resource management and ecosystem services.	Identify and adopt appropriate technologies that are low cost, user friendly, high impact and less damaging to the environment.	Long-term (5+ years)	Ministry of Agriculture and Fisheries Ministry of Education

4.3 Next steps

The development of these proposed activities for FCDO has been informed by desktop analysis and limited stakeholder engagement. It is recommended that further detailed analysis is undertaken to assess the potential for FCDO to engage with relevant government ministries, agencies, and communities, and confirm the need for financial and/or technical assistance across priority sectors. In particular, further engagement and discussions is recommended with relevant ministries to test the potential of the opportunities identified in this report. Further analysis is also required on the existing and planned initiatives and programs delivered by multilateral and bilateral partners to identify potential collaborations and to avoid duplication.

Several future areas of research have been identified in this report for which there was a lack of available information and limited insights during stakeholder engagement. These represent important topics that may influence the planning and delivery of FCDO activities within identified themes to help build climate resilience in Timor-Leste. Future areas of research include:

- The role of Tara Bandu in building human and institutional capacities to prepare for climate-related impacts and empowering communities to adopt and implement climate-resilient practices, and the potential to incorporate it into climate projects.
- Progress on community-based initiatives set out in national climate-related strategies and policies including the National Adaptation Plan.
- Delivery of sectoral initiatives and programmes set out in the National Adaptation Plan such as the development of sector-based adaptation plans. There is a current lack of evidence to demonstrate implementation of planned actions, except for the development of the Health National Adaptation Plan. It is unclear whether other ministries have progressed with the development of their sectoral plans.

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A1. Appendix A | Work Package 1

Executive summary

The Foreign, Commonwealth and Development Office (FCDO), Government of UK has commissioned a study to inform the British Embassy Jakarta's overall engagement with Timor-Leste in relation to climate change as well its strategy and approach for its Official Development Assistance (ODA) programming portfolio in Timor-Leste. The primary thematic focus for this study is climate change vulnerability¹ and resilience² in Timor-Leste. This is in reflection of the relevance of climate change to development in Timor-Leste, and the profile of UK ODA funding in the region.

The purpose of this study is to identify strategic entry points for deploying UK technical and financial assistance in a way that is responsive to, and supportive of, the Government of Timor-Leste's priorities. It will be delivered across four work packages (WP), outlined in Figure 1: Structure of this study.

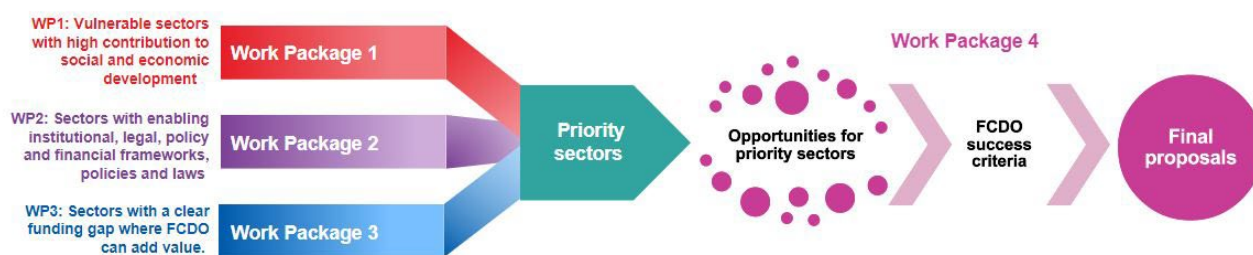


Figure 1: Structure of this study

The purpose of Work Package 1 (WP1) is to collate, summarise, and synthesise information about the vulnerability and exposure of priority sectors in Timor-Leste to climate impacts. In WP1, vulnerable sectors with high implications for social and economic development were found to include agriculture, health, water and sanitation, environment, education, and infrastructure. These sectors are vulnerable to numerous climate variables and associated risks causing cascading impacts for interdependent sectors. Poorer sanitation and hygiene as well as lower agricultural output compound health and productivity impacts, while disruptions to infrastructure and education access have both short and long-term impacts on economic growth. Moreover, climate-related risks within these sectors disproportionately impact vulnerable populations, including rural communities, women, and children.

This interim report sets out the preliminary findings from WP1. It has been prepared based on desktop review of key documentation and refined by ongoing engagement with stakeholders from the Government of Timor-Leste and multilateral agencies.

Key findings from WP1

All sectors are highly vulnerable to the impacts of climate change, including flooding, landslides, drought, sea-level rise, extreme heat, forest fires. Additionally, there are direct and indirect risks from climate change to social inclusion and gender equity, cultural heritage, rural development, and the private sector.

The implications of climate-related direct and indirect risks for social and economic development have been used to identify priority sectors for shaping appropriate opportunities and proposals for UK technical and financial assistance in WP4. Vulnerable sectors with high implications for social and economic

¹ Vulnerability refers to both physical and ecosystem vulnerabilities associated with climate change stressors, including the structural capacity of infrastructure and environmental conditions, and human vulnerabilities in relation to basic psychological needs, provision of food water and sanitation, energy and shelter (Arup, The Rockefeller Foundation , 2013).

² Resilience refers to the capacity of individuals, communities, institutions, businesses and systems to survive, adapt and thrive, no matter the kind of chronic stresses or acute shocks they experience (Arup , 2023).

development include agriculture, health, water and sanitation, environment, education, and infrastructure. These sectors are vulnerable to numerous climate variables and associated risks cause cascading impacts for interdependent sectors. Poorer sanitation and hygiene as well as lower agricultural output compound health and productivity impacts, while disruptions to infrastructure and education access have both short and long-term impacts on economic growth. Moreover, climate-related risks within these sectors disproportionately impact vulnerable populations, including rural communities, women, and children.

An example of this is the agricultural sector which serves as a primary source of income for over 66% of the rural population (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). The sector will be negatively impacted by climate change, specifically through increased temperatures and greater disparities in rainfall between the driest and wettest months. Such changes will lead to reduced farming productivity and crop failure. Furthermore, as demand for water increases, flooding and rising sea levels will further contaminate and salinate water sources, resulting in lower quantities and quality of available water. These impacts are particularly concerning given the population's reliance on subsistence agriculture, and the fact that food production is currently insufficient to meet the population's needs (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Consequently, these changes will have significant economic and health implications, including reduced income, higher food import expenses, and poor access to nutrition.

1. Analysis of vulnerability and resilience to climate change in Timor-Leste

1.1 Approach

To assess the impact of climate change on Timor-Leste, we conducted a screening based on the World Bank Climate and Disaster Risk Screening National Policy Level tool methodology. The methodology incorporates elements of the risk analysis framework adopted by the Intergovernmental Panel on Climate Change (IPCC) and the framework for vulnerability assessment used by the United States Agency for International Development (USAID). It involves characterising the environmental, socio-cultural, economic conditions of Timor-Leste, and identifying climate-related risks and opportunities for priority sectors.

Our review has been informed by:

- ADB Timor-Leste Country Gender Assessment 2014
- CFE Timor-Leste Disaster Management Reference Handbook
- IFRC Climate Change Impacts on Health and Livelihoods 2021
- IPCC AR6 WI The Physical Science Basis 2021
- IPCC AR6 WII Impacts, Adaptation and Vulnerability 2022
- IPCC AR6 WIII Mitigation of Climate Change 2022
- NAPGN How Timor-Leste is Using the National Adaptation Plan 2021
- OPM Review of Evidence - Asia Pacific Regional Climate Resilience Platform 2020
- RDTL National Adaptation Plan 2021
- UNDP Climate Public Expenditure and Institutional Review 2022
- UNDP National Coastal Vulnerability Assessment 2018
- UNDP Second National Communication 2020
- UNDP Vulnerability Assessment and Community Action Plan 2018
- WB Climate Risk Country Profile - Timor-Leste 2021
- WB National and Policy Climate and Disaster Risk Screening Tool
- WB National-Policy Level Tool Guidance Note
- WB Timor-Leste Water Sector Assessment and Roadmap 2018

Targeted interviews were conducted with key stakeholders to validate and refine the analysis of vulnerability and resilience in Timor-Leste. These interviews are summarised in Table 1-1.

Table 1-1: Overview of stakeholder engagement

Stakeholder	Organisation
Mr. Adão Soares Barbosa	H.E. Ambassador of Climate Change of Timor-Leste
AND I.P. President, Mr Pedro Marcal Director for Green Climate Fund and Climate Development Mechanism, Mr Antonio Abel	National Designated Authority for Combating Climate Change – Public Institution (AND I.P. – Portuguese acronym)
NPO President, NPO Advisor	National Procurement Office (NPO)

Stakeholder	Organisation
Director for the NDCC, Mr. Augusto Pinto	National Directorate for Climate Change (NDCC)
Mrs. Tomásia (MOH) Mrs. Elisa (ND for Environmental Health)	Ministry of Health (MOH), National Directorate (ND) for Environmental Health
Director General, Mr. Jose Alexandre Carvalho	Ministry of Finance

1.2 Climate characteristics and context

1.2.1 Geographic and environmental context

Timor-Leste is located in Southeast Asia, at the eastern end of the Lesser Sunda Islands of the Indonesian archipelago. The country spans the eastern half of the Timor Island, the exclave of Oecusse, and the islands Atauro and Jaco, with the capital Dili located on the northern coast of Timor Island. The country is approximately 14,954km² with a population of 1,395,000 people based on IMF estimates in 2022. It comprises 13 municipalities, six of which are coastal. There is approximately 747km of coastline in Timor-Leste with two-thirds of the population inhabiting these coastal areas (UNDP, 2023).

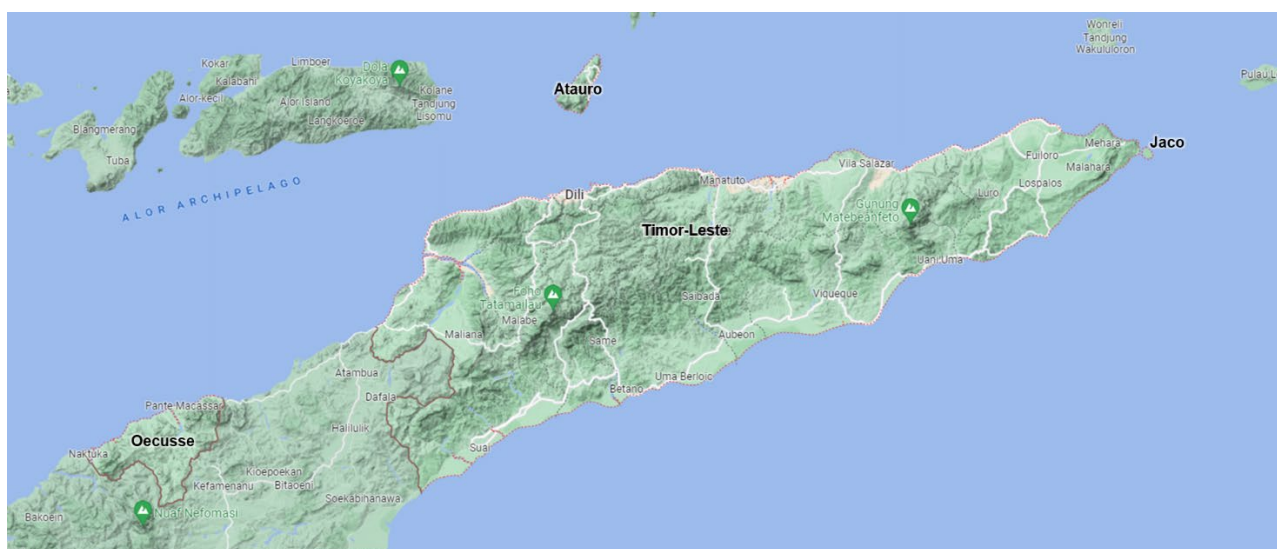


Figure 2: Timorese mainland, the exclave of Oecusse, and the islands Atauro and Jaco

Timor-Leste has mountainous topography with significant altitudinal variation across the country; approximately 44% of total land areas has a slope greater than 40%. The soils are generally shallow, rocky, and alkaline with low water-bearing capacity and high erodibility. Timor-Leste has a mountainous interior which extends to the northern coast and contains several peaks over 2000 m including the tallest, Mount Ramelau (2986 m). There are over 100 rivers in Timor-Leste, however very few streams flow year-round. The country's largest river is the River of Lifau, which flows from the central mountains to the north coast and serves as a key freshwater source. Other significant rivers include the Malibaka and the Benamauc.

Located within the Coral Triangle, Timor-Leste is a biodiversity hotspot with globally significant ecosystems, tropical rainforests, mangroves, wetlands, and diverse marine ecosystems (Democratic Republic of Timor-Leste - Secretariat of State for Environment, Coordinating Minister for Economic Affairs). The country comprises five global agro-ecological zones: marine and coastal; arid lowland; mountainous; highland plans; wetlands and lakes. Over a third of Timor-Leste is covered by various types of forest, mainly tropical rainforests and mangroves (Democratic Republic of Timor-Leste - Secretariat of State for Environment, Coordinating Minister for Economic Affairs). Waters surrounding Timor-Leste support high fish diversity and high coral reef cover (Ajaz, Bisht, Gogoi, Pervaiz, & Venkatramani, 2020).

1.2.2 Socio-cultural background

The population of Timor-Leste is approximately 1.3 million and growing currently at about 1.9% per year due to a high, but declining fertility rate (CEDMHA, 2022). The urban population comprises 31% of the total population, with an average annual change in urban population of 3% between 2015-2020 (World Bank Group, 2021c). The large majority (97%) of the population is Catholic with small groups of Protestant/Evangelical Christians (2%), Muslims (0.2%), and others (0.2%).

Timor-Leste is a young post-conflict nation, with reasonably well-functioning democracy. In 2016 Timor-Leste was ranked as the most democratic country in Southeast Asia, based on the electoral process and pluralism, the functioning of the government, political participation, political culture and civil liberties. In contemporary post-conflict Timor-Leste, Tara Bandu plays an important role alongside the formal justice system (Belun and The Asia Foundation, 2013). Tara Bandu is a traditional Timorese custom regulating people-to-people, people-to-animals, and people-to-environment relations to promote peace and reconciliation through public agreement. Tara means hang and bandu means ban or curse. Collectively, they mean that anything harming your fellow human and nature should be banned or cursed.³

It involves the hanging of a culturally significant item from a wooden shaft to place a ban on certain agricultural or social activities within a given area. Tara Bandu represents an important entry point for strengthening natural resource management systems and addressing identified conflict drivers in communities. Examples of successful implementation include on Atauro Island in Biqueli and Beloi where Tara Bandu has been used to protect mangrove areas and fish-stock (Global CAD, 2018).

Culturally, Timorese people also have strong faith in the *uma lulik*, which can be integrated with Tara Bandu. For example, in the Municipality of Lospalos, people are highly conscience of protecting the environment and not burning the land because of their strong tradition of faith in the things they consider as “*lulik*” or sacred. They believe that if you burn someone's land or property you will be cursed.⁴

Timorese women have been successful in securing equity at national level since gaining independence and the first elections in 2002, and the introduction of quota system in 2006, however at a local level 98% chiefs are men resulting in under-representation of rural women in the decision-making positions (Asian Development Bank, 2014). Women have poor but improving access to education and resources, with 31.9% women never having been to school as per 2015 census (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). According to the same census, there are varying levels of population receiving formal education, ranging between 55.55% in Oecussi and 77.34% in Dili (Global CAD, 2018).

According to the United Nations Development Programme's (UNDP) Human Development Index (HDI) assessment in 2019, Timor-Leste was ranked 141 out of 189 countries and territories, placing it in the medium human development category with an HDI value of 0.606. The HDI measures a country's average achievements in education, health, and income, indicating the level of human development and well-being in a country. Between 2000 and 2019, Timor-Leste's HDI value rose from 0.484 to 0.606 (UNDP, 2021).

Despite rapid progress on several health indicators, the country still suffers high rates of child mortality, malnutrition, and non-communicable diseases (UNDP & Ministry of Finance, 2022). The population faces multiple challenges, such as widespread poverty, underdeveloped economy, and poor access to water and sanitation (Secretary of State for Environment, 2020). Approximately 42% of the population is classified as living below the poverty line, based on data collected in 2014 (CEDMHA, 2022).

As a result of poverty, limited land availability, low livelihood diversity with a heavy reliance on the agricultural sector, and high climate sensitivity of income, the population are highly vulnerable to the impacts of climate change (World Bank Group, 2021c). Moreover, risks to the agricultural sector including poor soils and highly variable rainfall conditions will only be exacerbated by climate change, which is likely to increase the salination of groundwater resources (Geoscience Australia, 2012) (Molyneux, 2012).

Limited adaptive capacity to cope with the impacts of climate change is further eroded by other issues, as observed in 2021 when the population experienced the covid pandemic and severe flooding simultaneously.

³ Interview with H.E. Ambassador of Climate Change of Timor-Leste, Mr. Adão Soares Barbosa on 24 March 2023.

⁴ Interview with H.E. Ambassador of Climate Change of Timor-Leste, Mr. Adão Soares Barbosa on 24 March 2023.

The joint After Action Review (AAR) by the United Nations (UN) and non-government organizations (NGOs) and a Post-Disaster Needs Assessment (PDNA) report prepared by the UN Agencies and World Bank outlined the integral role of localisation and gender inclusion in future disaster risk planning. This is particularly applicable to vulnerable groups as defined by Timor-Leste's National Disaster Risk Management Policy, including women, children, the elderly, widows, returnees, refugees, religious and ethnic minorities, and individuals residing in areas prone to hazards. Women and children are at 14 times greater risk than the average population of death and injury in a natural disaster and the aftermath (CEDMHA, 2022). Based on a community-based vulnerability assessment conducted by the UNDP in 2018, the average vulnerability index across 24 sucos was 2.5, which falls under the high risk category of vulnerability, despite the progress in overall development in the country (UNDP, 2018). This is calculated as a product of exposure, sensitivity, and adaptive capacity. Cross-cutting issues driving low levels of adaptive capacity included insecure land tenure arrangements, inadequate human and financial resources, poor infrastructure, a lack of enabling policies and regulation, and weak coordination on planning for resilience.

1.2.3 Economic Profile

Timor-Leste is among the most oil-dependent economies in the world and is heavily reliant on petroleum, which remains a key sector despite Timor-Leste's petroleum resources facing imminent depletion and the insecurities this creates for fiscal stability (UNDP & Ministry of Finance, 2022). Oil and gas accounts for 90% of the country's Gross Domestic Product (GDP) and 70% of government spending (CEDMHA, 2022). Similarly, energy is the largest contributor to Timor-Leste's greenhouse gas emissions, comprising a total of 4,456.92 Gg CO₂e in 2015, followed by agriculture and waste comprising 665.76 and 181.1k7 Gg CO₂e, respectively (Secretary of State for Environment, 2020).⁵

Petroleum extraction is an economic activity that relies on funding from international sources and Timor-Leste heavily depends on imported, expensive diesel to generate electricity, with only 1% total electricity attributed to renewable sources (UNDP & Ministry of Finance, 2022).

Despite the high dependence on the petroleum sector for national revenue, only 0.1% of the population are employed in the sector (Scheiner, 2021) in comparison to approximately 64% of the population depending on agriculture for their livelihood (UNDP & Ministry of Finance, 2022).

Coffee remains the major source of household income for local people, although its production is restricted by altitude, rainfall and temperature, in addition to avocado, jackfruit, mangoes, cloves and black peppers (UNDP, 2018). The main staple crops are rice, maize, cassava and sweet potato (Asian Development Bank, n.d.) with a mixture of rain-fed zones and irrigated zones. Irrigated zones are largely rice-based whereas crops such as maize and cassava have more and adaptation across Timor-Leste (Williams, 2018).

The agricultural sector faces several issues, such as low yields, underdeveloped farming technology, and low crop diversity (UNDP & Ministry of Finance, 2022). Additionally, a significant portion of staple commodity crops are imported, increasing competition with local producers. For example, over the past 5 years, rice imports have provided greater than 70% of national requirements and in the first quarter of 2022 reached nearly three times the volume of the previous period at 60 000 tonnes (Food and Agriculture Organisation of the United Nations, 2022).

Alongside agriculture, tourism is outlined in Timor-Leste's Strategic Development Plan 2011–2030 as a key sector providing diversification to the economy and has been prioritised as a development opportunity by the government. Tourism is regarded as a key advancer of Timor-Leste's sustainable development goals, which is observable through the prioritisation of innovation and sustainability within this sector (Berno, 2021) (Weaver, 2017); (Courvisanos, 2018). However, COVID-19 has resulted in tourism-related businesses operating at approximately 23% of their previous capacity (Rajalingam, 2021). The hotel industry is a key employer with women comprising 62% of employees, but only 25% of management positions (da Silva, 2021); (Freitas, 2016).

⁵ CO₂e represents CO₂ equivalent
Gg represents Greenhouse Gas Emissions

1.2.4 Baseline climate and natural hazard profile

Timor-Leste is one of the most vulnerable and natural disaster-prone countries in the world, ranking seventh on UNCDP 2018 (UNDP, 2018) due to the medium exposure to multi-hazards, high levels of natural disaster vulnerability with associated risks for infrastructure, environment, stressors to quality of life and low adaptive capacity (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). The main climate-related hazards include flooding, erratic and extreme rainfall, landslides, tropical cyclones, coastal erosion, strong winds, heatwaves, drought, forest fires, sea-level rise, ocean acidification, epidemics, earthquakes, and tsunamis. Climate change threatens to increase the impacts already felt from landslides, floods, drought risk and landslides with a projected national average increase of 26.3%, 21%, 55.4%, and 55.8% for these events with associated economic losses in the order of US\$203 million, US\$37 million, US\$10 million, and US\$12.5, respectively.

The climate of Timor-Leste is classified as tropical savannah (Köppen–Geiger climate classification type Aw) with an average annual temperature of 24°C and 80% humidity. Typically, the wet season occurs between December and May when mean monthly precipitation ranges from 222–252 mm in the wettest months of December to March compared to 12–18 mm in the driest months of August and September. Tropical cyclones can affect Timor-Leste between November and April causing damaging storm surges, but their effect tends to be relatively weak due to the proximity to the equator (IFRC, 2021).

Given the country's location near the equator, the West Pacific Monsoon and a mountainous environment heavily influence Timor-Leste's climate, along with the El Nino Southern Oscillation (ENSO) (CEDMHA, 2022). Interannual variability associated with ENSO can impact the timing and interannual quantity of rainfall by up to 50% (World Bank Group, 2021c). The climate is also influenced by the Indian Ocean Dipole (IOD), the Pacific Decadal Oscillation (PDO), and the Madden-Julian Oscillation (MJO), although there is limited data on the magnitude of their impact.

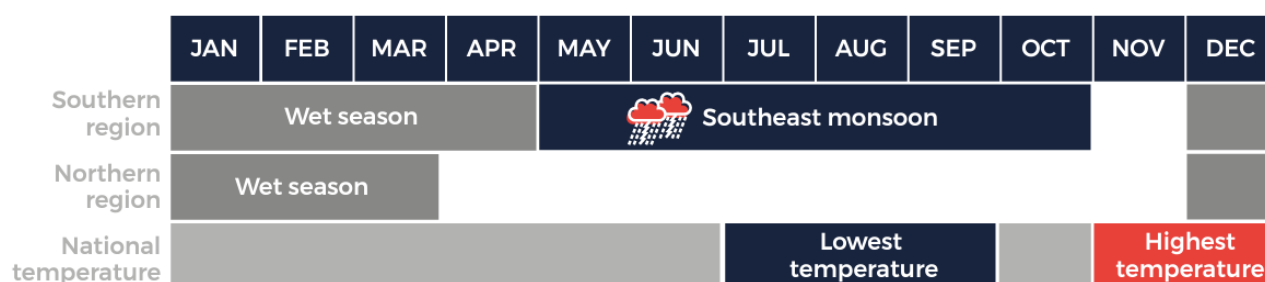


Figure 3: Seasonal calendar (IFRC, 2021)

Timor-Leste, like many other countries, has already experienced a range of observed changes in its climate, including (World Bank Group, 2021c) (World Bank Group, 2021d):

- **Increased temperature:** Average temperatures in Timor-Leste have been rising over the past few decades, which can have impacts on agriculture, health, and water resources. Observed annual mean temperature has increased by 0.2°C from 24.65°C in 1901 to 24.87°C in 2021. Average annual maximum and minimum temperatures have increased by the same magnitude over this period.
- **Changes in precipitation patterns:** Observed annual precipitation has decreased by nearly 400 mm, from 1308 mm in 1901 to 910 mm in 2021. While annual rainfall has decreased by nearly 40 mm per decade with frequent drought events, there has been an increase in intensity of heavy short-term precipitation events causing flooding, landslides, mudslides, and soil erosion.
- **Sea-level rise:** Coastal areas in Timor-Leste are experiencing sea-level rise, which can result in saltwater intrusion into freshwater resources, erosion of coastal areas, and increased risk of coastal flooding. Observed sea level rise is 9 mm per year since 1993, which is higher than the global average of 2.8 – 3.6 mm per year (World Bank Group, 2021c); (IFRC, 2021). Early indication of ocean acidification reducing reef growth and survival in the region has been observed (Ajaz, Bisht, Gogoi, Pervaiz, & Venkatramani, 2020).
- **Increased frequency and intensity of extreme weather events:** Timor-Leste is experiencing increased frequency of extreme weather events, such as drought, heavy rainfall, heatwaves, and strong wind

(Secretary of State for Environment, 2020). Cyclones have become less frequent, although the strongest cyclones are getting stronger (IFRC, 2021).

- **Increased risk of forest fires:** Changes in the climate, such as increased temperatures, prolonged droughts, and alterations to precipitation patterns, coupled with human activities such as land clearing, have increased the risk of forest fires. The majority of forest areas in Timor-Leste are highly vulnerable to forest fires, including areas in Dili, Liquiçá and Manatuto (Secretary of State for Environment, 2020).

Between 2001 and 2011 Timor-Leste has experienced 470 disaster events, of which floods accounted for 71% (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Most recently, Tropical Cyclone Seroja in April 2021 caused large-scale landslides and floods across the country, especially in the Capital Dili, impacting over 10% of the population in Timor-Leste (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021).

According to the Vulnerability Assessment and Community Action Plan released in 2018, local communities have observed changes at the suco-level (UNDP, 2018). These include:

- Fluctuations in seasonal calendar impacting flowering season and the timing and intensity of dry and rainy seasons.
- More intense hazards including stronger winds in summer, increased incidence of flash flooding, significant increase in landslide hotspots, and more frequent forest fires.

1.2.5 Future climate and natural hazard profile

Timor-Leste is highly vulnerable to climate and natural hazard disasters including earthquakes, tsunamis, cyclones, and heavy rainfall (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Climate change is expected to have a significant impact on Timor-Leste, as it amplifies existing stressors and introduces new ones.

Rising temperatures, heatwaves, and more intense and frequent extreme rainfall events, will result in floods, landslides, and forest fires across the country. Although there is considerable uncertainty around how climate change may affect the impact of El Niño-Southern Oscillation on rainfall patterns, projections suggest that wet seasons may become wetter, while dry seasons could become slightly drier (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Increasing atmospheric temperatures coupled with longer periods of drought may increase forest fires and water scarcity in Timor-Leste. While the number of tropical cyclones may decrease, their intensity will likely increase. Furthermore, rising sea levels will pose a persistent threat to the country's coastal regions, which are home to a significant proportion of the population (World Bank Group, 2021c).

These changes will have far-reaching impacts and promote very few opportunities for key sectors, causing considerable damage and downtime to critical infrastructure and livelihoods.

Compared to Southeast Asia and Indonesia, Timor-Leste is facing similar impacts from climate change. However, the country's adaptive capacity is particularly challenged by the effects of climate change on its agricultural sector. Around 70% of Timor-Leste's population lives in rural areas where there is a heavy household reliance on semi-subsistence and seasonal food cropping in addition to animal husbandry and foraging. With more than 50% of the population experiencing some degree of food insecurity, improvement on returns from the agricultural sector is vital to ensuring climate change resilience (Australian Centre for International Agricultural Research, 2023).

Impacts will be felt mainly through changes to water cycles and availability. Climate change could cause less rainfall, albeit with more intense rainfall events, creating a drier dry season. This outcome may exacerbate Timor-Leste's existing vulnerability to drought because of its high year-to-year rainfall irregularity and insufficient water infrastructure. Furthermore, flooding could become more prevalent in areas already prone to inundation on the southern side of the country. Such events are also likely to impact water quality as flooding events will increase levels of suspended sediment in water, which is already high due to the erosion of slopes in the area. If these events occur in conjunction with sea level rise, there is also likely to be more extreme flooding at the mouths of rivers, in turn affecting infrastructure occurring near shorelines including agricultural structures, which provide the main source of employment in Timor-Leste. Dili is also somewhat

vulnerable to sea-level rise due to its location on a coastal plain that extends inland to the base of a steep mountain range. Its intersection with the Comoro, Belmor and Benmauc rivers could cause flooding in the area as, although these rivers infrequently flood, increased rainfall events from climate change and more peak flows in addition to sea level rise could increase the likelihood of inundation (Barnett, 2007).

Based on a review of a range of potential climate scenarios and adaptation responses for Timor-Leste under RCP8.5 and SSP5-8.5, the negative impacts of several climate variables that may impact key sectors were identified and are briefly outlined below in Table 1⁶.

Table 1-2: Climate change projections (World Bank Group, 2021a) (World Bank Group, 2021b)

Climate variable	Description and relevance
Temperature	Average daily maximum temperatures are expected to increase, resulting in higher probability of heatwaves. This in turn has an impact on ocean chemistry, sea level rise and atmospheric moisture capacity (leading to higher humidity and heavier rainfall events).
Precipitation	Generally, it is predicted that there will be a decrease in dry season rainfall and an increase in wet season rainfall, with extreme rainfall days occurring more frequently. Changes to precipitation patterns are likely to have significant implications for agriculture and reduced surface water and groundwater availability. Additionally, higher than average rainfall can lead to increased flooding, landslides and erosion, with associated infrastructure and environmental damage.
Drought, forest fire, flooding and landslides	Increasing frequency and intensity of extreme weather events with longer dry seasons are leading to more pervasive droughts (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021), which are typically associated with El Niño years and, in the years following, higher than average rainfall can lead to increased flooding. Increasing frequency and intensity of extreme weather events with longer dry seasons are leading to more pervasive droughts (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021), which are typically associated with El Niño years and, in the years following, higher than average rainfall can lead to increased flooding. Drier conditions increase risks of forest fire and reduce quantity of water sources. In addition to infrastructure and environmental damage, flooding can frequently cause additional run-off, soil erosion and landslides, causing land degradation and contamination of water sources.
Cyclones	Tropical cyclones can affect Timor-Leste but their effect currently tends to be relatively weak due to the country's proximity to the equator (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Future projections suggest that while frequency will decrease, intensity may increase, affecting larger areas. Additionally, cyclones can cause secondary hazards with their own severe effects, as in the case of Tropical Cyclone Seroja in 2021: although it did not make landfall in Timor-Leste, it caused flash flooding, landslides and liquefaction, and affected all thirteen of the country's municipalities (CEDMHA, 2022).
Sea level rise	Sea level rise is expected to continue. The rate of rise as at the development of the NAP was 5.5 mm/year, with projections that the rate would increase in future (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Sea level rise may contribute to coastal erosion, and saltwater intrusion may impact on soil quality for agriculture, damage assets through corrosion if not adequately protected, and reduce availability and quality of water sources.
Ocean acidification	Oceans are absorbing a large amount of the yearly carbon dioxide emitted to the atmosphere, increasing their acidity. This is expected to increase, negatively affecting the development of corals, including risk of coral bleaching.

⁶ Climate data from the World Bank Climate Change Knowledge Portal has been sourced from the global climate model compilations of the Coupled Model Inter-comparison Projects (CMIPs). Data has been collated from CMIP5 and CMIP6, derived from the fifth and sixth phases of the CMIPs. These support the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) and Sixth Assessment Report (AR6), respectively. Representative Concentration Pathways (RCP) are a set of four greenhouse gas concentration trajectories adopted by the IPCC in AR5. RCP8.5 represents a high emissions scenario leading to a radiative forcing of 8.5 watts per square meter by the year 2100. AR6 identifies five different Socioeconomic Development Pathways (SSPs) that provide different plausible narratives of global development and how they may affect climate change. SSP5-8.5 is a specific scenario within the Socioeconomic Development Pathway 5 (SSP5) that assumes high challenges to mitigation and adaptation, with a global population that peaks at around mid-century and then gradually declines. In this scenario, the world is characterized by rapid economic growth, technological progress, and high levels of energy consumption. Energy demand is met primarily by fossil fuels, with limited investment in low-carbon technologies.

1.3 Climate-related risks and opportunities

Timor-Leste will experience significant shocks and stresses as a result of climate change, which will have far-reaching effects on key sectors through considerable damage and downtime to critical infrastructure and livelihoods. Direct climate-related risks for assets, systems, and communities will drive cascading indirect impacts across sectors.

Direct risks refer to the immediate impacts of climate change on the population and the environment. For example, increased frequency and intensity of extreme weather events, such as cyclones and floods, can lead to loss of life and damage to infrastructure, crops, and other assets. This can create a significant burden on already vulnerable communities, who may lack the resources to recover from these events.

Indirect risks refer to the longer-term impacts of climate change on the social, economic, and environmental systems that support human well-being, communities, and the economy. For example, changes in precipitation patterns and temperature can lead to decreased crop yields and declining agricultural productivity, which can result in food shortages, malnutrition, and loss of livelihoods.

Potential benefits from climate change are limited to agriculture where increasing carbon dioxide concentrations and temperature may benefit certain crops such as rice, sweet potato, and peanuts. If effective management and diversification of these crops is implemented, improved yields and expansion of agricultural land may be enabled in some areas, creating new opportunities in the agricultural sector. However, these benefits may be offset or cancelled out by risks to agriculture, such as lower reliability and quality of water, soil quality impacts and erosion. Additionally, for the tourism sector, climate change may expand coral reefs, mangroves, beach areas, and forests, creating new opportunities for ecotourism. On the other hand, some of these opportunities may be undermined by damage and degradation of existing assets through processes such as coastal erosion and coral beaching.

The potential benefits of climate change may be limited in Timor-Leste. However, it is still important to consider these benefits alongside the significant challenges posed by climate change so that adaptation and resilience efforts, including individuals; communities; institutions and businesses capacity to respond appropriately and thrive, can appropriately mitigate the negative impacts while also taking advantage of the opportunities that may arise.

Climate-related risks have been identified across the following priority sectors shown in Table 2 and identified in the Timor-Leste Climate Public Expenditure and Institutional Review in 2022, conducted by the Ministry of Finance (UNDP & Ministry of Finance, 2022):

Table 1-3: Timor-Leste's development priorities in 16 sectors (UNDP and Government of Timor-Leste, 2021)

Social capital	Economic development	Infrastructure development
Education	Rural development	Telecommunications
Health	Agriculture	Airports
Social inclusion	Petroleum	Sea ports
Environment (including ecosystems and biodiversity)	Tourism	Electricity
Culture and heritage	Private sector	Water and sanitation
		Roads and bridges

Direct risks have not been identified in this work package for social inclusion and gender equity, cultural heritage, rural development, and the private sector, as they have been captured as indirect risks from other key sectors.

Climate-related risks for priority sectors presented in Table 1-4. Findings from stakeholder engagement interviews are presented in Section 1.3.1.

Table 1-4: Climate change risks

Agriculture 		Education 	Environment 	Health 	Roads and bridges 
Climate variable	• Temperature • Precipitation • Flooding • Drought • Forest fire • Sea level rise	• Flooding • Landslide	• Temperature • Precipitation • Flooding • Drought • Landslide • Forest fire • Ocean acidification	• Temperature • Precipitation • Humidity • Flooding • Drought • Landslide • Cyclone	• Flooding • Cyclone • Landslide
Impacts (direct and indirect risks)	• Degradation of farming land leading to crop failure, lower productivity, lower national revenue and inhibited rural development • Increased irrigation demand but lower quality and availability of water • Food insecurity and malnutrition due to disruption of production and higher food prices • Disruption to supply chains affecting agriculture and other major industries (including private sector)	• Damage and temporary closure or loss of access to schools/education infrastructure • Higher levels of absenteeism among students due to increased diseases or disruptions • Damaged sanitation facilities in schools and/or increased demands at home discouraging attendance of women and girls	• Native species extinction, loss of biodiversity, increased likelihood of trophic collapse • Declining ecosystem services, including carbon sequestering, water filtration, pest control • Coastal erosion and infrastructure damage, impacts on livelihoods that depend on natural resources, fewer employment opportunities for coastal communities • Decreased mental wellbeing, loss of identity, place, and cultural heritage • Declining fish stocks and food insecurity	• Heat and humidity-related illness and death (e.g. pneumonia and respiratory tract infections) • Increased incidences of vector-borne and waterborne diseases such as cholera and typhoid fever • Reduced labour force productivity, impacts on livelihoods • Disproportionate impact on rural areas and vulnerable groups including women and children who have poor access to services • Disruption to healthcare services and damage to health infrastructure due to extreme weather events	• Damaged infrastructure, including transport, eroding investments and leading to isolation of vulnerable communities and lack of access to basic services • Interrupted logistics and access routes further reduces productivity and enterprise opportunities, limiting economic growth • Long travel times to health facilities, low access to healthcare services (particularly for women and rural communities) likely to ultimately lead to lack of treatment
Electricity and telecommunications 		Petroleum 	Tourism 	Water and sanitation 	Sea and airports 
Climate variable	• Flooding • Cyclone • Landslide • Sea level rise	• Sea level rise • Cyclone	• Temperature • Precipitation • Flooding • Drought • Cyclone • Ocean acidification • Sea level rise	• Precipitation • Flooding • Drought • Sea level rise	• Flooding • Cyclone • Landslide • Sea level rise
Impacts (direct and indirect risks)	• Damaged infrastructure, such as electricity and telecommunications, eroding investments and leading to isolation of vulnerable communities and lack of access to basic services • Emigration from coastal areas lowers the overall resilience of coastal communities as more vulnerable people are unable to relocate	• Reduced national economic revenue from damage to oil and gas infrastructure • Increased health and environmental risks from spillage/release of oil and potentially hazardous contaminants	• Major transport disruption due to damage to tourism infrastructure (i.e. airports, bridges) • Reduced tourism due to safety concerns from natural hazards and public health risks (vector- and water-borne diseases) • Degradation of natural tourist attractions (e.g., beaches, reefs, forests) • Lower economic opportunities increase poverty, migration, and social unrest, further deterring tourism	• Damage to water infrastructure reduces access to water • Lower availability and quality of water due to contamination and saltwater intrusion • Increased incidence of waterborne diseases and health issues related to lack of hygiene and sanitation • Reduced availability of freshwater for irrigation increases crop failures and reduces agricultural productivity • Increased school and work absenteeism especially for women and girls travelling further for water	• Damaged infrastructure, including transport, ports, leading to isolation of vulnerable communities and lack of access to basic services • Disruptions to supply chains reducing productivity, increasing prices and increasing vulnerability due to lack of access to goods and services • Increased flooding and sea level rise may impact on airport and seaport investments if not incorporated into siting and building processes

1.3.1 Stakeholder engagement findings

Arup met with the H.E. Ambassador of Climate Change of Timor-Leste, Mr. Adão Soares Barbosa, on 24th February 2023, and the National Designated Authority of Timor-Leste on 30th March 2023, which assisted in identifying vulnerabilities and key risks associated with Timor-Leste's priority sectors. The following excerpts identify key takeaways from those engagements.

H.E. Ambassador of Climate Change of Timor-Leste

- **Agriculture** – Timor-Leste is at risk of extreme rainfall and a prolonged dry season, causing landslides and erosion, which strips away vegetation and damages soil health, carrying nutrients into the sea and causing reductions in agricultural productivity every year. In turn, these effects will impact food security. Majority of the Timorese population are engaged in agriculture activities, and so if the sector is impacted, it will affect their food supply and livelihoods. Domestic rice production in Timor-Leste cannot provide for the whole country, and so supply is being compensated through rice imports. Hence, with increasing changes in climate, farmers will face even more barriers to local rice and crop cultivation.
- **Infrastructure** – extreme weather events will cause more natural disasters and damage to infrastructure, in addition to loss of life, such as the flooding that occurred on 4th of April 2021. The damages or losses from the 4th of April disaster were calculated to be USD50millions.
- **Health** – access to clean water and sanitation can be difficult due to the existing scarcity of water and with increasing temperatures, there are more cases of dengue expected in the country.
- **Water** – springs and water sources are starting to dry-up, and water volume is decreasing with cascading challenges anticipated for animals and agricultural lands dependant on this water. Increasingly, cows are dying more each year due to drought, which is affecting the availability of grass to feed on. Soil moisture is also decreasing due to absence of water and plants.

Timor-Leste is also impacted by slow on-set events such as sea level rise (evidence of which can be seen from the intrusion of water in Pantai Kelapa road) causing coastal erosion. Increases in temperatures are also making the country much more prone to bushfires and prolonged drought.

Overall, it is crucial to understand that vulnerability is assessed based on exposure to climate hazards and the capacity to adapt and cope with these changes or ways in which to move away from the hazards. For example, the UK is also exposed to climate change impacts such as sea level rise and extreme weather events, but they have the capacity to adapt and cope with the changes. On the other hand, Timor-Leste is exposed with no capacity to move away or adapt to climate-related changes.

National Designated Authority of Timor-Leste

Within the next 20 years, Timor-Leste is facing the impacts of climate with the potential for various catastrophes to affect the Timorese people and government. Community living along coastal areas is experiencing sea level rise, sea water interruption into community fresh water, high damage to infrastructure and loss of assets along coastal areas. The long droughts, landslides, extreme heat and wind are becoming a regular occurrence. Every year heavy rain causes the destruction of roads and bridges, water supply systems, and irrigation systems. As the main source of income for community in rural areas, the agricultural sector is facing a decrease in land and agricultural production, contributing to food insecurity.

1.4 Implications for social, economic, and infrastructure development

Climate change and its associated impacts on communities, economic activity, and ecosystems pose major barriers to Timor-Leste achieving post-conflict nation building and its Strategic Development Plan 2011–2030 (Government of Timor-Leste, n.d.). While every sector is vulnerable to the impacts of climate and natural hazards, reducing the climate vulnerability of highly interdependent priority sectors can contribute towards strengthening social and economic development in Timor-Leste. This may be further enabled through driving effective and resilient infrastructure development.

Table 4 summarises climate change stressors on social and economic structures that have been used to identify priority sectors. Social development considers health, social inclusion, gender equity, education, and justice. Economic development comprises employment, total national revenue and economic activity, diversified industries, and the poverty rate. Evaluation of level of social and economic development has been determined through peak body and government sources referenced in the approach, which revealed that some key sectors display higher climate-associated risks than others.

Table 1-5: Social and economic Implications of climate-related risks on priority sectors in Timor-Leste

Priority sector	Social development	Economic development	Rationale
Agriculture	High	High	- Approximately 80% of the population is dependent on agriculture for their livelihoods therefore climate-related impacts on agriculture will substantially impact household income and national employment rate and flow-on impacts for education and health (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021) (UNDP & Ministry of Finance, 2022). A thriving and climate-adapted agriculture sector is thus intrinsically linked to other key sectors and so its success is essential so that other sectors can thrive. - Climate-related impacts on production and yield will affect food insecurity and human health, including potential for increasing malnutrition rates and disproportionate impacts on vulnerable peoples. - Climate change will impact domestic food commodity prices, increasing food insecurity and poverty for rural and urban populations (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). - Women and men are both heavily involved in the agriculture sector, and there is a need to focus on women's participation as they have limited participation in farmer groups which may exclude them from small-scale adaptation opportunities (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). - Unsustainable resource management (including land use and irrigation) and environmental degradation hinder opportunities for economic diversification into areas such as tourism, deplete natural resources including water for drinking and sanitation, and can cause the deterioration of cultural heritage and significance.
Environment	Medium	High	- Climate-related impacts on the environment in addition to deforestation and land degradation significantly hinder social and economic development in Timor-Leste due to the high dependence on natural resources and ecosystem services for human health and wellbeing, tourism, agriculture and fisheries, education, and rural development. - Women are more dependent on climate-sensitive natural resources, with limited alternative livelihood opportunities as well as low involvement in decision making (IFRC, 2021). - Unsustainable resource management (including land use and irrigation) and environmental degradation hinder economic opportunities such as tourism, deplete natural resources including

Priority sector	Social development	Economic development	Rationale
			water for drinking and sanitation, and can cause the deterioration of cultural heritage and significance. The Strategic Development Plan 2011-2030 identifies agriculture, and tourism industries as two of the three strategic priority sectors to diversify the economy and reduce reliance on the petrochemical industry (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). These are both highly dependent on a thriving and resilient environment.
Education	High	Medium	- Climate-related impacts on education infrastructure. During the quarter-century conflict for independence with Indonesia, 90% of schools were destroyed across Timor-Leste along with the only higher education institution at the time (IFRC, 2021). - Access to education will also present substantial barriers to social development. Ongoing damage and disruption to education infrastructure may hinder progress on enrolment in schools. - Efforts are underway to integrate climate change and environmental knowledge into primary and secondary education (IFRC, 2021). By incorporating climate change education into the curriculum, students will be better equipped with the knowledge and skills needed to understand the risks and opportunities associated with climate change. Increased education and awareness of climate change will foster more interest in climate-related careers and entrepreneurship, leading to the development of innovative solutions and technologies that can help address climate change challenges. This will create new opportunities for economic growth, job creation, and investment. Conversely, a lack of education and awareness on climate change increases the vulnerability of households and communities to adverse impacts.
Health	High	High	- Climate-related impacts on health infrastructure and public health (including vector-borne and water-borne disease, and heat-related illness and mortality) significantly hinder progress on social and economic development. - Public health issues arise from climate impacts on other sectors including reduced crop yields and low water quality; these can undermine food security and increase rates of malnutrition. - Increased morbidity and mortality rates negatively impact education, employment, and labour productivity in Timor-Leste leading to cascading economic outcomes for households, communities, and the national economy. - Vulnerable peoples including women are disproportionately impacted by cascading climate-related impacts on the health sector, reducing overall social inclusion and gender equity. This will be caused by an exacerbation of existing pressures on resources that is likely to increase barriers to accessing health care information and services (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). - Public health issues can deter tourism, reducing its potential to generate income and employment opportunities for national and local community economies. Tourism has been identified as major growth sector for Timor-Leste (Government of Timor-Leste, n.d.).
Infrastructure (inclusive of roads and bridges, electricity, ports, airports, telecommunications)	Medium	High	Infrastructure in Timor-Leste has been ranked 6th most vulnerable in the world, based on 2013 data (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Climate and natural hazard-related disruption causes cascading impacts for health, education, agriculture, tourism, the private sector, and communities due to the heavy reliance on transport infrastructure for movement of goods and services, and access to basic services.

Priority sector	Social development	Economic development	Rationale
			Resilient and effective infrastructure is a critical enabler of economic development. Infrastructure damage and downtime can disrupt work and market access, creating financial burden for households and increasing poverty (IFRC, 2021).
Water and sanitation	High	Medium	- High level of dependence on ecosystem services as the basis of livelihoods increases overall vulnerability to water insecurity caused by low level of water management efficiency and effectiveness, high levels of catchment degradation, and high vulnerability to climate change impacts such as saltwater intrusion and flood-related contamination (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). - The aquifers with the highest vulnerability to climate change are coastal intergranular aquifers with smaller catchment areas and both fissured and localised aquifers in topographic highs (Wallace, et al., 2012). Damage to vulnerable water infrastructure and water sources will create challenges for accessing water for drinking, sanitation, and other purposes. - Climate change will also impact access to water. 40% of the population travel 30 minutes to access water with women in particular playing an important role in collecting water for rural communities, sometimes travelling hours to retrieve it. Their ability to undertake this role will be challenged by other climate change stressors on the environment, roads, infrastructure, sanitation and access to clean drinking water. Such challenges may also have unexpected impacts on other sectors such as education and women's ability to attend school (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). - Less than 50 per cent of the overall population have access to basic sanitation (IFRC, 2021). Lack of access to sanitation is a leading reason for girls dropping out of school (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Resilient water and sanitation in schools and communities will promote increased attendance and education outcomes to benefit the wider economy. - Improved sanitation typically yields about \$9 worth of benefits for every \$1 spent, based on a reduction in direct and indirect health costs, better education, improved water supply and increases in tourism (Government of Timor-Leste, n.d.).
Tourism	Medium	Medium	- Tourism is identified as one of the three critical industries for economic development in Timor-Leste (Government of Timor-Leste, n.d.). A successful tourism industry will contribute income to national and local economies and create employment and business opportunities if supported by relevant education and training. The tourism sector relies on core infrastructure including roads and bridges, electricity, telecommunication, airports and ports, which are all highly vulnerable to the impacts of climate change. - Climate and natural hazards may negatively impact on nature-based tourism resources including biodiversity, coral reefs and coastal ecosystems (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021).
Petroleum	Low	Medium	Petroleum has been a significant driver of economic growth in Timor-Leste over the last two decades. While the oil and gas sector accounts for 90% of Timor-Leste's Gross Domestic Product (GDP) and 70% of government spending (based on 2019 data), it does not generate many direct employment opportunities due to an absence of processing facilities in the country (CEDMHA, 2022). All production is processed abroad. As such, the sector has limited direct impact on social development via education, employment, and poverty reduction.

Priority sector	Social development	Economic development	Rationale
			- Government revenue generated by the oil and gas sectors has allowed the government to invest in social programs and infrastructure development. Oil and gas companies operating in Timor-Leste have also invested in community development programs such as building community centres and providing clean water and sanitation facilities. - The Strategic Development Plan 2011-2030 identifies agriculture, manufacturing, and tourism industries as three strategic and priority sectors to diversify the economy and reduce reliance on the petrochemical industry (Secretariat of State for Environment, Coordinating Minister for Economic Affairs, 2021). Recent explorations show that oil and gas production can be extended until 2025, therefore does not represent a long-term driver for economic development (CEDMHA, 2022).

Agriculture, environment, health, and infrastructure sectors are most vulnerable to climate-related risks for economic development. Agriculture, in particular, is at high risk due to its high employment rate and the threat to food security, which would disproportionately impact vulnerable groups and worsen social development. The environment sector is heavily intertwined with threats to agriculture. Climate-related threats to the physical environment will degrade agricultural resources and create major economic losses for other industries, including key infrastructure, with flow-on effects for public health infrastructure, worsening pressures on the health system as well as increase morbidity from lack of access to food and water resources.

Infrastructure underpins each of these sectors and so will inevitably be affected by their collapse, and in turn contribute to their vulnerabilities, including in the education sector, which may experience high social development risks due to the potential for damaged infrastructure hindering enrolment in schools. Although, education employs a smaller proportion of the population compared to other key sectors, it is still a medium risk for economic development. There are also efforts underway to strengthen opportunities in this sector by integrating environment and climate knowledge into the curriculum, increasing its resilience to climate-related risks.

Climate-related risks for infrastructure are highly interdependent with the water and sanitation sector, impeding economic development. Moreover, these interconnections with other critical sectors have a ripple effect on essential social development issues related to water, such as access to clean and safe drinking water, with women and rural communities being the most severely affected.

Threats to tourism are also heavily interlinked with threats to other key sectors, placing it at moderate risk relative to impacting sectors such as environment, infrastructure and water and sanitation. Despite being a significant driver of economic growth, petroleum only employs a small proportion of Timor-Leste's population with production processed abroad. Hence, relative to other key sectors, economic and social development for the petroleum sector is deprioritised.

1.5 Key findings

Based on the foregoing analysis, the **priority sectors** identified by the Government of Timor-Leste for economic development in its National Strategic Development Plan 2011-2030 have been narrowed down to priority sectors that are climate-vulnerable. Climate change and its associated impacts on communities, economic activity, and ecosystems pose major barriers to Timor-Leste achieving post-conflict nation building and its Strategic Development Plan 2011–2030 (Government of Timor-Leste, n.d.). While every sector is vulnerable to the impacts of climate and natural hazards, reducing the climate vulnerability of highly interdependent priority sectors can contribute towards strengthening social and economic development in Timor-Leste.

The sectors that are most vulnerable to climate change that are more critical for social and economic development include environment, health, water and sanitation, agriculture, and infrastructure.

Environment is the most interdependent sector in Timor-Leste. Key threatening climate stressors include an increase in extreme weather events, warming average annual temperature and changing rainfall patterns, damage to habitat for local species, and loss of biodiversity.

A resilient and biodiverse environment underpins two of the three critical sectors for economic development in Timor-Leste: agriculture and tourism. Environmental changes will compound existing stressors related to unsustainable resource management and land use practices including deforestation. Hence, enhancing the resilience of environment sector, both in terms of the physical environment and its relationship to social development, will support a resilient agriculture sector, improving food security, nutrition, and overall health across Timor-Leste. Environment is also important for water quality and availability.

Due to the dependence of key sectors on the environment, it is expected that social development, particularly access to healthcare and education, will be limited further for vulnerable groups as environmental constraints will present additional barriers to accessing these services. The centrality of the environmental sector to the other sectors makes it a key sector to focus on for intervention. There is potential to ameliorate the environmental constraints through increased investment and focus on the established Tara Bandu principles.

Health is central to social development and economic development. Climate change will impact health infrastructure, access to health services, and will also drive increasing morbidity and mortality. Low community health and wellbeing substantially disrupts economic productivity, access to education, and overall social development with a disproportionate impact on vulnerable cohorts.

Water and sanitation sector threats include vulnerabilities associated with sea level rise, flooding, and drought. These key threatening processes will result in direct impacts on health and agriculture by limiting access to clean drinking water, potable water and freshwater resources in addition to groundwater impacts. Indirect impacts will also be felt in the education and tourism sectors because of decreased sanitation and an increase in health-related impacts.

Agriculture is a key employment sector supporting the majority of local employment in Timor-Leste and is highly vulnerable with direct impacts expected for food security, livelihoods and health outcomes. Its resilience, including its capacity to continue to be a key employment sector and ensure food security, is reliant on stable infrastructure and water supply. Hence there is a need for sustainable resource and land management delivered through Tara Bandu and other mechanisms.

Infrastructure including roads and bridges, airports and ports, electricity and telecoms underpin major growth industries for social and economic development including tourism and agriculture. Without due consideration and planning for climate-related shocks and stresses, infrastructure damage and failure will create cascading impacts for communities and their ability to access basic services and support economic activity.

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A.2 Appendix B | Work Package 2

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Executive summary

The Foreign, Commonwealth and Development Office (FCDO), Government of UK has commissioned a study to inform the British Embassy Jakarta's overall engagement with Timor-Leste in relation to climate change as well its strategy and approach for its Official Development Assistance (ODA) programming portfolio in Timor-Leste. The primary thematic focus for this study is climate change vulnerability¹ and resilience² in Timor-Leste. This is in reflection of the relevance of climate change to development in Timor-Leste, and the profile of UK ODA funding in the region.

The purpose of this study is to identify strategic entry points for deploying UK technical and financial assistance in a way that is responsive to, and supportive of, the Government of Timor-Leste's priorities. It will be delivered across four work packages (WP), outlined in Figure 1: Structure of this study.

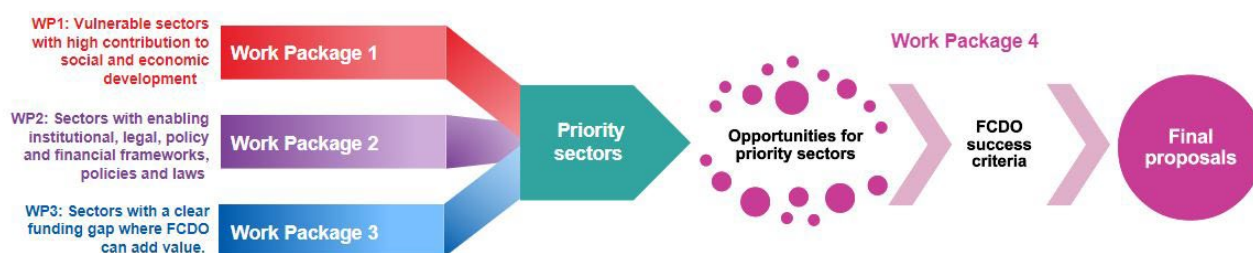


Figure 1: Structure of this study

Priority sectors will be identified based on a critical review of Timor-Leste's vulnerability and exposure to climate change and implications for social and economic development; interrogation of climate-related institutional, legal, and financial arrangements including enablers and constraints; and mapping external technical and financial assistance for climate-focused programs including multilateral and bilateral ODA finance. Once priority sectors have been distilled, opportunities and strategic entry points will be identified and prioritised to align with FCDO success criteria. The proposals developed in this study will guide the nature of future decision-making for FCDO in Timor-Leste and will provide support regarding building climate resilience. It is vital that the recommendations are robust, evidence-based, and relevant to the priorities of Timor-Leste and FCDO alike.

This report sets out the final findings from WP2. It has been prepared based on desktop review of key documentation and refined by ongoing engagement with stakeholders from the Government of Timor-Leste, multilateral agencies and with Arup's in-country consultants.

The purpose of this report is to provide an understanding of the enabling environment and potential barriers for effectively deploying UK technical and financial assistance, which will inform our final recommendations to FCDO.

Key findings from WP2

The key sectors identified in the National Adaptation Plan align with the sector selection from WP1 of this study, except for Disaster Risk Reduction and Tourism. This includes Infrastructure, Health, Agriculture, Water and Biodiversity and Ecosystem (which can be considered as Environment).

The process of developing the National Adaptation Plan helped to consolidate different initiatives in different sectors into a coherent plan with clear priorities. However, while the importance of climate change

¹ Vulnerability refers to both physical and ecosystem vulnerabilities associated with climate change stressors, including the structural capacity of infrastructure and environmental conditions, and human vulnerabilities in relation to basic psychological needs, provision of food water and sanitation, energy and shelter (Arup, The Rockefeller Foundation, 2013).

² Resilience refers to the capacity of individuals, communities, institutions, businesses and systems to survive, adapt and thrive, no matter the kind of chronic stresses or acute shocks they experience (Arup, 2023).

is recognised at the strategic level, engagement with key ministries and authorities under this study, such as Ministry of Health and the National Designated Authority for Combatting Climate Change, among others, revealed that there is still relatively low engagement with and ownership of activities under the NAP.

There are seven government entities that are key actors in Timor-Leste's climate-related governance. These entities have one of two functions: oversight/high-level decision-making or coordination. Despite the presence of coordinating bodies, coordination between sectoral ministries at the political level remains a challenge according to a consultation with the H.E. Ambassador of Climate Change of Timor-Leste. This suggests that the Climate Change Working Group, the existing inter-ministerial mechanism for coordination chaired by the National Directorate for Climate Change, has sectoral representatives mainly from the technical level.

The key ministries to lead on the implementation of the National Adaptation Plan align with the abovementioned key sectors, including the Ministry of Agriculture and Fisheries (MAF), Ministry of Public Works (MPW), Secretariat of State for the Environment (SSE), and Ministry of Health (MOH).

While each ministry or secretariat has climate-related institutional, policy, legal and financial arrangements in place to support adaptation projects, there are some critical constraints that need to be addressed. Notably, stakeholder consultations revealed a need to translate high-level adaptation priorities into sectoral plans and strategies as MOH had done to develop the Health National Adaptation Plan (H-NAP). Once these plans are developed, financial and human capacity support is needed for their implementation. With the example of H-NAP, the plan has not been fully utilised as it has yet to receive funding for its implementation and has not been widely circulated amongst key stakeholders (e.g. civil servants and working professional).

1. Political economy analysis

1.1 Approach

A political economy review of institutional, policy, legal and financial arrangements related to climate change adaptation and climate change mitigation was conducted across government entities to distil current roles for effective climate action. The main focus of the review is climate adaptation, but arrangements related to climate mitigation have also been reviewed for context.

Our review has been informed by:

- Asian Development Bank (ADB) Country Partnership Strategy 2022
- ADB National Climate Change Legal Frameworks in Asia and the Pacific 2020
- ADB Timor-Leste Economy Predicted to be Among Worst Hit by Climate Change 2013
- ADB Pacific Finance Sector Brief: Timor-Leste 2019
- Belun and The Asia Foundation (TAF) Tara Bandu: Its Role and Use in Community Conflict Prevention in Timor-Leste 2013
- Coral Triangle Center (CTC) Timor-Leste Marine Protected Area Learning Sites
- Democratic Republic of Timor-Leste (DRTL) Nationally Determined Contribution Timor-Leste 2022–2030
- Development Asia How Timor-Leste Can Increase Private Investment 2020
- Development Asia Sustainable Financing for Resilient Roads in Timor-Leste 2021
- DRTL Timor-Leste Strategic Development Plan 2011–2030
- DRTL Timor-Leste National Tourism Policy
- DRTL Government Resolution No. 8/2022 National Climate Change Policy
- DRTL Decree-Law No. 42/2022 establishing a designated National Authority for Combating Climate Change
- DRTL Decree-Law No. 41/2022 for creating a National Environmental Licensing Authority
- DRTL Decree-Law No. 6/2020 instituting the legal regime for the protection and conversation of biodiversity
- DRTL Decree-Law No. 26/2012 establishing the Environmental Basic Law
- DRTL Decree-Law No.6/2004 general bases of the legal regime for the management and planning of fisheries and aquaculture
- DRTL Program of the Sixth Constitutional Government 2015-2017
- DRTL State Budget Book 3A: Infrastructure Fund 2022
- DRTL Multi-annual Indicative Programme 2021–2027
- Economic Intelligence Unit Infrascopes: The Enabling Environment for Public-Private Partnerships 2017
- Global Environment Facility (GEF) IKAN Adapt: Strengthening the Adaptive Capacity, Resilience and Biodiversity Conservation Ability of Fisheries and Aquaculture-Dependent Livelihoods in Timor-Leste
- GEF Technology Needs Assessment (TNA) Phase IV 2019

- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) The Landscape of Climate and Disaster Risk Insurance in South and Southeast Asia and Oceania 2020
- Green Climate Fund (GCF) Private Sector Facility 2019
- International Monetary Fund (IMF) Democratic Republic of Timor-Leste: Selected Issues 2022
- International Renewable Energy Agency (IRENA) Energy Profile Timor-Leste 2022
- Ministry of Education, Youth and Sport (MOEYS) National Education Strategic Plan 2011–2030
- Ministry of Social Solidarity and Inclusion (MSSI) National Disaster Risk Management Policy 2008
- The Organisation for Economic Cooperation and Development (OECD) Monitoring the Principles for Good International Engagement in Fragile States and Situations Country Report 6: Democratic Republic of Timor-Leste 2010
- Oxfam Engaging with Customary Law to Build Climate Change Resilience in Timor-Leste 2015
- Secretariat of State for the Environment (SSE) Timor-Leste National Adaptation Plan 2021
- University College London (UCL) Economic Cost of Climate Change Could Be Six Times Higher Than Previously Thought 2021
- United Nations Development Programme (UNDP) and Ministry of Finance (MOF) Timor-Leste Climate Public Expenditure and Institutional Review 2022
- UNDP and DRTL Integrated National Financing Framework for Sustainable Development of Timor-Leste: Summary for the Policy Makers 2023
- UNDP, DRTL and World Bank Timor-Leste Post Disaster Needs Assessment 2022
- UNDP New Blue Economy Opportunities for Timor-Leste 2022
- UNDP Timor-Leste Launch GCF-Backed Project to Protect Rural Communities Against Climate Change 2020
- UNDP Integrated National Financing Framework and Financial Diversification in Timor-Leste
- UNEP Major New Project to Enhance Early Warning Systems for Increased Climate Resilience in Timor-Leste 2021
- UNOPS Fighting Climate Change with Resilience in Timor-Leste 2022
- UN Joint SDG Fund Integrated National Financing Framework (INFF) and Financial Diversification in Timor-Leste
- UN Joint SDG Launch of Timor Leste's Climate Public Expenditure Review 2023
- United Nations (UN) Government of Timor-Leste and Partners Appeal for US\$32 Million to Assist Flood Victims and Early Recovery 2021
- USAID Climate Change and Tourism in Timor-Leste: The Time to Act is Now 2021
- WaterAid Accessing Climate Finance for Sustainable Water, Sanitation and Hygiene Services in Timor-Leste 2017
- World Bank and MOF Public Expenditure and Financial Accountability Assessment 2018
- World Health Organisation (WHO) Developing of Health National Adaptation Plan (H-NAP) and H-NAP Formulation in Timor-Leste 2019
- targeted stakeholder consultations as part of the cross-cutting engagement strategy, and

- internal consultations with CRI Timor regarding current policy, regulation, key inter-governmental relationships and the future direction of policy in Timor-Leste.

Targeted interviews were conducted with key stakeholders to validate and refine the political economy analysis for Timor-Leste. These interviews are summarised in Table 1.

Table 1: Overview of stakeholder engagement

Stakeholder	Organisation
Mr. Adão Soares Barbosa	H.E. Ambassador of Climate Change of Timor-Leste
AND I.P. President, Mr Pedro Marcal Director for Green Climate Fund and Climate Development Mechanism, Mr Antonio Abel	National Designated Authority for Combating Climate Change – Public Institution (AND I.P. – Portuguese acronym)
NPO President, NPO Advisor	National Procurement Office (NPO)
Director for the NDCC, Mr. Augusto Pinto	National Directorate for Climate Change (NDCC)
Mrs. Tomásia (MOH) Mrs. Elisa (ND for Environmental Health)	Ministry of Health (MOH), National Directorate (ND) for Environmental Health
Director General, Mr. Jose Alexandre Carvalho	Ministry of Finance

1.2 Overview of climate-related governance

1.2.1 Key climate-related policies

There are four key climate-related policies at the national level that are contributing to policy awareness of climate change across government and setting the direction for climate action. An overview of these policies including relevant targets, principles and priorities has been provided below.

1.2.1.1 Strategic Development Plan 2011-2030

The Strategic Development Plan 2011-2030 (herein the Plan) establishes the long-term, broad strategic vision for the country's development (DRTL, 2011). The Plan highlights the criticality of addressing climate risks to national development. When the Plan launched in 2011, Timor-Leste did not have any climate-focused policies. The Plan was the first implicit mandate for taking climate action. The Plan makes the connection between climate change and social capital, infrastructure development and economic development, helping to put into context why climate change matters to Timor-Leste.

Now that the National Climate Change Policy, Nationally Determined Contribution and National Adaptation Plan have been published and endorsed by the Timor-Leste Government, the Plan is important for the alignment of climate goals to national priorities. Climate policies needs to be linked to the Plan as it is a keystone policy document that informs a variety of other strategies and plans. This is important for mainstreaming the climate agenda.

The Plan identified and introduced some climate-related programmes to be established by relevant sectoral ministries. Notably, it initiated the establishment of the country's first National Programme of Adaptation to Climate Change (NAPA) and outlined a target for 70% of actions under the programme to be implemented by 2020. This marked the first time that national climate adaptation priorities were identified in the country. It is difficult to determine whether this target has been reached as NAPA was consolidated with other adaptation programmes in the process of developing the National Adaptation Plan (NAP), which commenced before 2020. The actions that were not implemented under NAPA carried over into the NAP. Out of a total of 22 programmes, six were first identified under NAPA. On the one hand, the total financing mobilised to implement the actions under NAPA, in excess of USD 32 million, surpassed the initial estimate of USD 21 million (SSE, 2021). This could suggest that a significant portion of actions were implemented. On the other hand, another explanation for why many actions were carried over could be that short-term actions were

initiated that later inspired full-fledged programmes under NAP. This is because actions under NAPA were intended to be short-term whereas the programmes under NAP are longer-term.

An overview of the key climate-related targets from the Plan have been provided in Table 2 below and organised according to implementation timeline. The targets shown in red indicate that it has been completed or significant progress has been made towards achieving it. Some evidence behind this is elaborated below.

Table 2: Key climate-related targets in the Strategic Development Plan 2011-2030

Timeline	Targets
By 2015	- Environmental Basic Law: will be the legal framework to protect and conserve the environment - National Authority for the Mechanisms of the Kyoto Protocol: a designated authority will be operational - National Climate Change Centre: a designated centre will be operational - Community-based nurseries: one million trees per year nationwide will be planted - National Biodiversity Law and a Wildlife Conservation Law: will be created to protect and conserve biodiversity - Public awareness: public awareness of environmental protection will be enhanced - Drainage system: operation and maintenance of the Dili drainage system will be improved - Wind power infrastructure: Lariguto Wind Farm will be constructed - Solar power centre: solar power centre will be established in Dili - Renewable energy feasibility studies: feasibility studies will be conducted on prospects of attracting gas processing facilities, on potential mini-hydro sites, and on the viability of building a thermoelectric power plant to generate electricity from household and industrial waste
By 2020	- National Adaptation Programmes of Actions under the United Nations Framework Convention on Climate Change: 70% of actions will be implemented - Sewage infrastructure: appropriate, well-operated and maintained, sustainable infrastructure for the collection, treatment and disposal of sewage in Dili will be developed - Household solar power: approximately 100,000 families will have access to solar powered electric light - Drainage systems: all districts will have improved drainage systems - Renewable energy: at least 50% of national energy needs will be met from renewable energy sources
By 2030	- Extensive network of land and marine national parks: will protect the country's distinct biodiversity - Health care infrastructure: 100% of health services will be delivered from infrastructure that is functional, safe, environmentally friendly and sustainable - Transport infrastructure: new bridges will be constructed to provide all-weather access on all national and district road routes - Drainage systems: all subdistricts will have improved drainage systems - Renewable energy: all households in Timor-Leste will have access to electricity either by the conventional expansion of the electricity system or through the use of renewable energy

Some targets have been completed through Decree-Laws, for example, the Environmental Basic Law and the National Biodiversity Law. These Decree-Laws can be found in Annex A where there is a detailed table of climate-related institutional, policy, legal and financial arrangements organised by government entities. For drainage, projects like Ministry of Public Works (MPW)'s five-year construction and rehabilitation of Dili's drainage infrastructure indicate that progress has been made. For sanitation, sanitation infrastructure projects in Dili were approved for ADB financing in 2022. For solar power, Korea International Cooperation Agency is funding an initiative to give rural parts of Timor-Leste access to electricity from solar power.

While some have been completed or progressed, it should be noted that delays in the implementation of most targets were observed. For instance, the National Biodiversity Law came into force in 2020 and the National Designated Authority was created in 2022, which is five to seven years after they were supposed to be

implemented. There could be several reasons behind this, some of which are likely covered in Section 2.3 on catalysts and constraints.

Three targets will need relatively more help to progress. Drainage works are still focused in urban areas, primarily in Dili, and are less focused in rural areas. The country is still far from its renewable energy target to meet at least 50% of national energy needs from renewable energy sources as renewables sources only represented 8% of the total energy supply in 2019 (IRENA, 2022). Raising public awareness  environmental protection and nature regeneration is a considerable endeavour to be undertaken according to a consultation with the National Designated Authority for Combatting Climate Change (NDA).

1.2.1.2 National Climate Change Policy

In early 2022, through Government Resolution No. 8/2022 the Council of Ministers approved the National Climate Change Policy (NCCP) as the central policy framework for guiding the country's national approach to climate action (DRTL, 2022). The National Directorate for Climate Change (NDCC) under the Secretariat of State for the Environment (SSE) is responsible for developing a National Climate Change Strategy and Action Plan to implement the measures that are listed in the NCCP in the coming years.

Timor-Leste's vision, main objective and principles relating to climate change, as outlined in the NCCP, have been summarised below:

Vision

Become a climate resilient country, promote and protect the rights of its citizens, and equip the people of Timor-Leste with the capacity to face the adverse impacts of climate change and prosper according to the principle of sustainable development.

Objective

This document establishes a clear statement framing political principles and laws related to climate change and clarifies the mechanisms that the Government intends to deploy to respond to climate change. This policy brings together the extensive range of adaptation and mitigation policies that are currently in place in Timor-Leste across different sectors.

Principles

National ownership: climate change is mainstreamed into sectoral policies and plans

- actions are catered to national needs and conditions
- whole-of-government is committed and assumes responsibility for sustainable and climate resilient development
- sustainable financial packages are developed to ensure optimal implementation of the policy

Equity and social inclusion: climate change impacts on different groups are considered

- gender considerations are mainstreamed into policies and plans
- interventions are designed to bring people together and includes all groups within a given target community
- youth are mobilised as ambassadors of change for long-term development

Informed and effective participation: stakeholders are encouraged to participate in decision-making and enforcement of action at all levels

- community-based adaptation approaches are taken
- all policies and laws have a monitoring and evaluation cycle for consistent feedback
- community awareness and capacity to integrate resilience into climate change and climate adaptation measures in development plans and budget requests at the local level is facilitated and strengthened by Ministries

The updated NDC also specifies some urgent areas where technical and financial support are needed for its objectives to be met. This includes, but is not limited to, the following priority initiatives:

Critical areas for technical and financial support

Understanding climate risks: improve the understanding of and ability to assess climate risks and for improving national climate information services.

Improving climate change, sustainable development and disaster risk capacity: improve the national capacity to cope with and address the nexus of natural disasters, climate change-related impacts, sustainable development and the mid-term impact of the COVID-19 pandemic (with financial assistance).

Designing and regulating effective nature-based solutions: improve the enabling environment for these solutions such as by developing new land tenure legislation (with financial assistance).

Scaling up renewable energy and improving national GHG reporting: establish a robust national GHG inventory (with financial assistance like concessional financing).

Developing integrated water management capacity: develop capacity and associated resourcing.

Conducting research: conduct research on topics related to food security and transitioning livelihoods.

Improving the capacity of public health infrastructure: improve the capacity to cope with changing needs and growing pressures arising from climate-related impacts (with financial assistance).

Mapping climate vulnerabilities: map vulnerabilities and assess damage risk and potential losses.

Minimising and averting loss and damage: increase access to risk transfer solutions, build capacity to improve social protection mechanisms, and increase the overall access to risk financing solutions (with financial assistance).

Building coastal resilience: build resilience and minimise the risk of coastal community displacement (with financial assistance).

Accelerating and executing mitigation and adaptation objectives: accelerate and execute objectives through technology transfer and reduced landed cost of key new technologies.

1.2.1.4 National Adaptation Plan

In 2021, the NAP was submitted to the UNFCCC. The process of developing the NAP consolidated activities from different actors under a single, coherent national programme. This includes several years of adaptation work through the Intended NDC, NAPA and GCF Country Programme. SSE oversees the development and implementation of the NAP at the policy level (SSE, 2021).

The NAP sets out a number of concrete adaptation priorities for the country, which have been summarised below based on whether its applicable at the policy, sector or project and programme level:

Policy level

National Climate Change Policy: finalise the policy that will define objectives and a vision for addressing climate change and provide the mandate for the NAP

Tarabandu: integrate climate-related issues such as water conservation, water use management and climate risk reduction

Sector level

Assessment of key sectors: prepare detailed vulnerability assessments for the following sectors:

- infrastructure
- biodiversity and ecosystem

- health
- agriculture
- water
- disaster risk reduction
- tourism

It is worth noting that the sector selection from WP1 of this report aligns with the key sectors identified in the NAP except for Disaster Risk Reduction and Tourism.

Project and programme level

Human capacity: strengthen the capacity of national, local institutions and communities in managing climate risks. More specifically:

- improve physical infrastructure and natural vegetation methods
- review existing infrastructure laws, regulation and standards
- enhance early warning systems

Vulnerable communities and groups: identify and address the needs of vulnerable communities and groups. More specifically:

- reduce the vulnerability of farmers and pastoralists
- improve institutional and community (including women and children) capacity
- integrate climate risk information into traditional disaster risk reduction and management
- integrate water conservation, water use management and climate risk reduction approaches into Tarabandu

Ecosystem-based disaster risk reduction: use this approach in coastal areas and coral reefs. More specifically:

- maintain mangrove plantations
- promote awareness to protect coastal ecosystems from sea level rise and its impacts

Water resources management: improve water resource management as part of climate action. More specifically:

- build climate-proof and environmentally sustainable infrastructure
- create and enhance water harvesting, water distribution and management systems
- develop integrated agroforestry and watershed management
- control amount of water used by industry
- standardise water pollution control
- design a water management system
- implement integrated water resource management approaches
- enhance government and community strategies to respond to drought
- promote water conservation, protection of springs and recharge of the ground water sources

Sustainable land management: promote sustainable land management as part of climate action. More specifically:

- implement integrated sustainable land management that promotes climate resilient practices

- reduce climate vulnerability of forests through reforestation degraded lands
- provide a sustainable source of fuel wood
- enable productive rural communities
- promote sustainable and conservation agriculture practices that have minimal negative impact on the environment
- avoid agricultural activities in climate-risk prone areas

Public health: improve public health services to manage climate-related health issues. More specifically:

- develop a health database and data management system which includes climate sensitive health risk and vulnerability information
- establishing surveillance for health early warning systems and response mechanisms for climate-related health risks

Livelihoods: build climate-resilient livelihoods. More specifically:

- develop alternative livelihood options to enhance community resilience through fisheries and marine ecosystem-based bio-physical resources

National support programme for the NAP process: incorporate the recommendations for strengthening human and institutional capacities and improving knowledge management infrastructure for climate adaptation outlined in the NAP into the funding proposal to the GCF to support the ongoing activities of the NAP process under the national support programme

The adaptation priorities laid out in the NAP have been mapped to some of these government entities in Table 3 below.

Table 3: Lead entities of the adaptation priorities laid out in the NAP at policy, sector and project/programme levels

Adaptation priorities laid out in NAP	Lead entities	Timeline
Policy level		
Finalise the National Climate Change Policy	SSE, NDCC	Completed
Integrate climate-related issues into Tarabandu	SSE, Ministry of Agriculture and Fisheries (MAF), MPW, Secretary of State for Civil Protection (SSCP)	2-3 years
Sector level		
Infrastructure priorities and programmes	MPW, SSE, Ministry of Urban Planning and Development (MUPD), Universidade Nacional Timor Lorosa'e (UNTL)	Not applicable
Biodiversity and ecosystem priorities and programmes	MAF, SSE, Ministry of Education, Youth and Sport (MOEYS), Ministry of Higher Education, Science and Culture (MHESC), UNTL	Not applicable
Health priorities and programmes	Ministry of Health (MOH), SSE, UNTL	Not applicable
Agriculture priorities and programmes	MAF, SSE, MOH, MOEYS, MHESC, UNTL	Not applicable
Water priorities and programmes	MPW, MAF, SSE, UNTL	Not applicable
Disaster risk reduction priorities and programmes	SSE, SSCP, MAF, MOEYS, MHESC	Not applicable
Tourism priorities and programmes	Ministry of Tourism, Trade and Industry (MTTI), SSE, MAF, MOEYS, MHESC, UNTL	Not applicable
Project and programme level		
Strengthen the human capacity in managing climate risks	MPW, MAF, SSE, Ministry of Transport and Communications (MTC)	3-6 years
Identify and address the needs of vulnerable communities and group	SSE, MAF, SSCP, MPW	2-10 years
Use an ecosystem-based disaster risk reduction approach in marine environments	MAF, MPW, SSE	3-6 years
Improve water resource management as part of climate action	MPW, MAF, SSE	3-10 years
Promote sustainable land management as part of climate action	MAF, SSE	2-10 years
Improve public health services to manage climate-related health issues	MOH	2-5 years
Build climate-resilient livelihoods	MAF, SSE	3-5 years
Support the ongoing activities under the national support programme	SSE	2-3 years

Of the four policies explored above, the NAP, NDC and Strategic Development Plan appear to be the most widely understood and authoritative. Key climate-related stakeholders including the Ministry of Finance

(MOF) and ADB did not mention NCCP in recently published literature and in consultation (ADB, 2022). A representative from MOF only mentioned the NAP, NDC and Strategic Development Plan when asked which are the main policies underpinning the government's climate agenda.³ The NCCP is excluded again in the Climate Public Expenditure and Institutional Review carried out by UNDP and MOF, which is a review of national climate policies. The NCCP is similarly not referred to in Country Partnership Strategy 2023-2027.

The NCCP is relatively more recognised in the national climate policy space as the NDC and NAP both reference it. However, there is some evidence that suggests that stakeholders are not yet able to clearly articulate what the NCCP speaks to that is different than the NDC or NAP. It was clearly articulated in consultations with the Ambassador and NDA that the NAP is a key policy for long-term adaptation priorities, the NDC is a key policy for mitigation targets and that there are clear linkages between the three policies.^{4,5} While the NCCP was mentioned, there was no further articulation of its role. This could change over the coming years as effort is underway to disseminate information related to the NCCP with communities and stakeholders according to a consultation with NDA. However, it is unclear which communities and stakeholders this would entail.

Across the four policies, implementing the identified programmes and priorities will likely require more efforts. Some evidence to support this observation include two recent policies in the health sector (i.e. the National Action Plan for Health Security 2020-2024 and the National Health Sector Nutrition Strategic Plan 2022-2026) that do not explicitly reference the NCCP or NAP, although there is mention of adaptation-related topics like disaster risk and climate-induced malnutrition risk. This is important because these policies are intended to inform climate-related aspects of sectoral policies. It was revealed that the future pipeline of GCF programmes have not been identified yet.⁶ This is contradictory as the GCF Country Programme is supposed to be aligned with the NAP's programmes. NDA expressed concern over the fact that policies should not remain as documents, but be further discussed and acted on, reinforcing the need for engagement and ownership over the NAP's programmes.

1.2.2 Key climate-related governance

There are seven government entities that are key actors in Timor-Leste's climate-related governance. These entities have one of two functions including oversight/high-level decision-making or coordination. An overview of their functions and key relationships can be found in Figure 2 below. Their functions and areas of collaboration are elaborated below, followed by a brief discussion on how authoritative and effective these entities appear to be.

³ Interview with Ministry of Finance on 08 March 2023.

⁴ Interview with H.E. Ambassador of Climate Change of Timor-Leste, Mr. Adão Soares Barbosa on 24 March 2023.

⁵ Interview with National Designated Authority for Combating Climate Change on 30 March 2023.

⁶ Interview with National Designated Authority for Combating Climate Change on 30 March 2023.

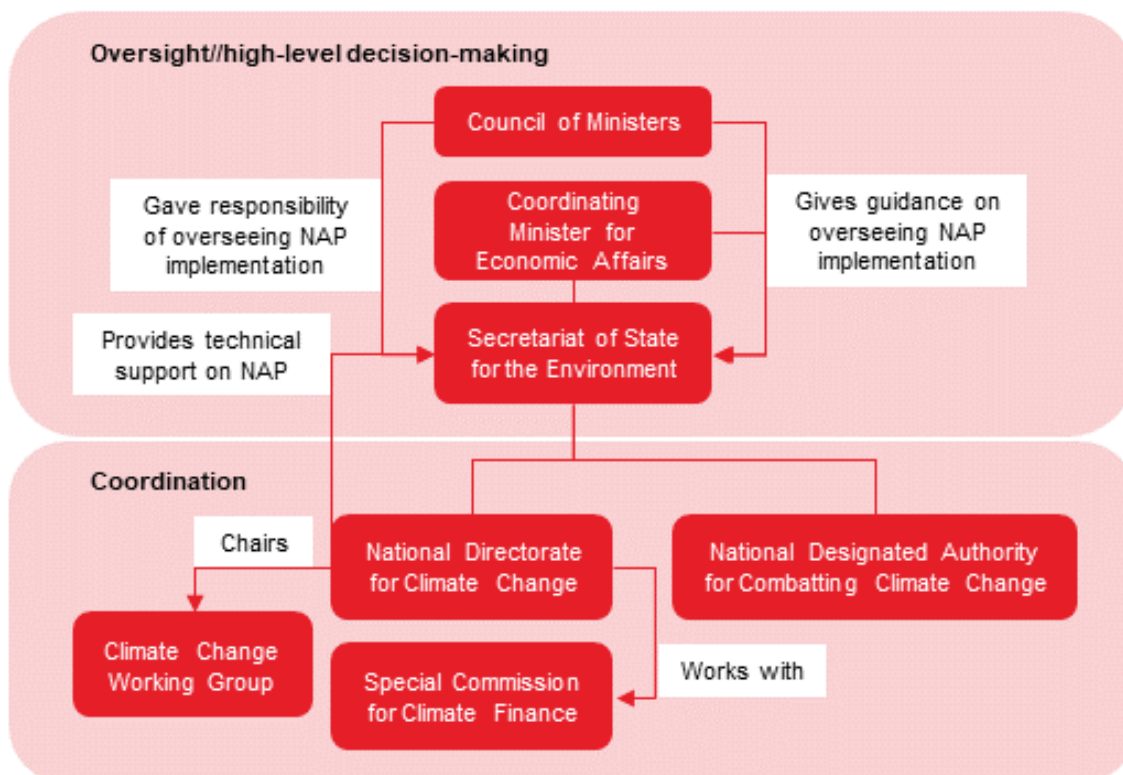


Figure 2: Key climate-related governance including functions and key relationships

Council of Ministers the highest decision-making authority regarding mainstreaming of climate strategies into sectoral policies and plans. The Council of Ministers has delegated the responsibility of overseeing the development of the country's NDC to the Coordinating Minister for Economic Affairs (DRTL, 2022) and the responsibility of overseeing NAP implementation to the Secretariat of State for the Environment.

Secretariat of State for the Environment (SSE) under the Coordinating Minister for Economic Affairs is responsible for overseeing NDC implementation and for overseeing the development and implementation of the NAP at the policy level (SSE, 2021). It is the interim high-level operational body for NAP implementation. SSE receives guidance on overseeing NAP implementation from the Council of Ministers and the Coordinating Minister for Economic Affairs.

National Directorate for Climate Change (NDCC) under the SSE is responsible for coordinating and progressing climate action at the political and technical level by working with sectoral ministries. It is the interim technical coordinating body and secretariat for NAP implementation in the short term and will develop the National Climate Change Strategy and Action Plan in the coming years. NDCC provides technical support to SSE on NAP implementation.

National Designated Authority for Combatting Climate Change (NDA) under the SSE is responsible for implementing the flexibility mechanisms of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and serves as the point of contact between government and the GCF. It coordinates and monitors all activities related to GCF in the country. Its main mission is to improve participation of national public and private entities in climate mitigation and adaptation projects to ensure national ownership.

Climate Change Working Group (CCWG) was established as the main mechanism for coordination and consultation with different stakeholders on climate change, including NAP implementation. It is chaired by NDCC and its membership body comprises of relevant ministries, international organisations and donors, private sector, academia and civil society. It has multi-stakeholder representation, though the majority are expected to be public entities including NDCC, Centre of Climate Change and Biodiversity (CCCB) and national directorates under relevant sectoral ministries. National and international NGOs are expected to be the second most common stakeholder group, followed by academia such as the National University of Timor-Leste which co-established the CCCB with MTTI. CCWG is identified in the NAP as the lead entity

for three programmes that rely heavily on stakeholder consultation. This includes the development of common methodology for sectoral vulnerability and risk assessments, identification of specific provisions (including sectoral and vertical coordination mechanism) for legal mandate of the NAP through consultative processes, and dissemination of a draft legal instrument to support the NAP for peer review and consultation.

Special Commission for Climate Finance was recently established as the main mechanism for the facilitation and coordination of climate finance to support priority climate mitigation and adaptation projects (DRTL, 2022). Its functions include assessing climate investment priorities, reviewing funding proposals, and monitoring climate investment projects. It comprises high-level representatives from relevant ministries including MOF and the Ministry of Foreign Affairs and Cooperation (MFAC). The participation of other ministries depends on their relevance to the issues being discussed. The Special Committee for Climate Finance will also work with the NDCC to identify funding sources, including domestic sources, private sector possibilities, and international financiers to provide grants and loans to support projects.

Despite the presence of coordinating bodies, coordination between sectoral ministries at the political level remains a challenge according to a consultation with the Ambassador. It could be that the institutional structure for coordination, which appears complex, lends itself to coordination issues. It could also be that the NDCC, which chairs the CCWG, has greater influence at the technical level than the political level.

The CCWG might not have the power and influence to effectively fulfil its given responsibilities under the NDC and NAP. It was observed that the CCWG mainly comprises national directorates under sectoral ministries, which tend to have focused mandates. There is the National Directorate of Research and Statistics and the National Directorate of Irrigation and Water Use Management under MAF to name a few examples. This could be addressed by introducing sectoral representatives that sit at the ministerial level to the CCWG or by creating a separate inter-ministerial working group at the political level as the Ambassador suggested in consultation.

Two nuances between the intended role and the actual role played by NDCC and NDA were observed. Firstly, it was revealed in consultation with NDCC that the right protocol for bilateral engagement on climate matters is through the Ambassador despite its given role to work with the Special Committee for Climate Finance to identify funding sources for projects. Secondly, NDA monitors at the ministerial level and ensures that ministries have sectoral adaptation plans and programmes as revealed in consultation with the authority, though this is not described in public documents. This means that there are overlapping mandates between the NDCC and NDA.

1.2.3 Climate-related institutional, policy, legal and financial arrangements

There are 15 sectoral ministries and public entities that also have climate-related institutional, policy, legal, and financial arrangements. These arrangements are either cross-sectoral or sector-specific. A selection of the arrangements of key ministries leading NAP implementation have been provided in Table 4 below. Further details on these arrangements and those of other climate-related government entities can be found in Annex A.

The key NAP implementing entities include SSE, MPW, MAF, and MOH. This was validated in consultation with MOF which identified MAF, MPW and SSE (excluding MOH) as the main entities implementing policies and programmes related to climate adaptation.

A critical insight is that while there may be strong strategies, plans and targets in place, the funding for implementation and capacity building has not been adequate to implement all of these strategies at scale.^{7,8,9,10} This is largely true for all sectoral strategies, especially for health and tourism sectors.¹¹ One case

⁷ Interview with H.E. Ambassador of Climate Change of Timor-Leste, Mr. Adão Soares Barbosa on 24 March 2023.

⁸ Interview with National Designated Authority for Combating Climate Change on 30 March 2023.

⁹ Interview with Ministry of Health on 02 February 2023.

¹⁰ Interview with National Procurement Office on 23 February 2023.

¹¹ Interview with National Designated Authority for Combating Climate Change on 30 March 2023.

in point that that the H-NAP, the country's first sectoral adaptation plan, has not yet receiving funding for its implementation.

Table 4: Overview of climate-related institutional, policy, legal and financial arrangements adopted by key NAP implementing entities

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Secretariat of State for the Environment (SSE)	11 divisions have climate-related mandates including the NDCC, NDA, among many others. One reason for the coordination constraints at the political level observed by the Ambassador in consultation is the fact that the institutional structure of SSE is quite large and perhaps complex.		National Adaptation Plan identifies the SSE co-responsible for mobilising international sources of funding and ensuring the release of funds for approved adaptation projects alongside MOF. This overlaps with the mandates of MFAC and the Special Commission for Climate Finance. NDCC and the General Directorate for Environment (under the SSE) are implementing the project on enhancing human resources, systems and procedures to effectively engage with the GCF. There are overlapping mandates between NDCC and NDA in this regard.
Ministry of Public Works (MPW)	One division has climate-related mandates to maintain and conserve the conditions of roads and bridges and recover it as part of emergency response, rehabilitate rural roads, plan and design of roads, bridges and flood control, and ensure work quality control. However, this does not cover the need to develop climate resilient infrastructure from the earliest stages of feasibility and design.	Mandate to integrate climate considerations into the legal framework for water supply and sanitation and the strategy around for its implementation. Mandate to prepare technical regulations for promoting renewable energy.	Infrastructure Fund has funded LiDAR survey and spatial mapping activities that are highly climate relevant for rural development. Consolidated Fund of Timor-Leste (CF-TL) has funded the development of renewable energy production plants, installation and maintenance of photovoltaic systems. Budget allocations need increasing in order for the target of meeting at least 50% of energy needs from renewable sources according to the CPEIR. Supported implementation of GEF-funded project on Strengthening the Resilience of Small Scale Rural Infrastructure and Local Government Systems to Climatic Variability and Risk.
Ministry of Transport and Communications (MTC)	Two divisions have climate-related mandates including providing strategic and political guidance for developing climate resilient transport and communications infrastructure. Potential climate impacts on the telecommunications sector are not addressed in any policy document as the CPEIR revealed.	Mandate to develop the legal framework and regulate the activities of the climate resilient land transport sector.	CF-TL has funded their work to develop meteorological, climatology and seismology surveillance systems. This is needed to support local climate data and information. However, the CPEIR indicates that funding has not been adequate. MTC spent USD 53,810 in highly relevant climate projects in 2021 while MPW spend USD 1,792,682. Infrastructure Fund has supported transport sector resilience. Funded projects must meet requirements in a climate and disaster survey as part of the Feasibility Study Guideline.
Ministry of Agriculture and Fisheries (MAF)	Four divisions have climate-related mandates, one of them being the National Directorate of Agricultural Extension (DNEA). DNEA should be informed about the role they have to play in providing adaptation training and sharing climate sensitive	Decree-Law No. 6/2004 on the legal regime for the management and regulation of fisheries and aquaculture	One of the leads of IKAN Adapt, one of the key ongoing climate financing programmes, which that seeks to strengthening the adaptive capacity, resilience and biodiversity

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
	practices to farmers and group associations according to the CPEIR.	establishes and regulates the importance of biodiversity and conservation.	conservation ability of fisheries and aquaculture-dependent livelihoods in Timor-Leste. Supported UNDP in the implementation of GEF-funded Coastal Resilience Programme to enact nature-based approaches to coastal protection and to develop supportive policies and institutional capacity.
Ministry of Health (MOH)	An unconditional commitment to implement the overarching objectives to the H-NAP was put forth in the updated NDC, with specific elements conditional to securing technical and financial support. H-NAP is a key document that guides the investment and the intervention of climate change in the health sector. Financial and human resources are the main constraints of H-NAP implementation according to MOH. While it is a useful document, it has not been fully utilised yet. The National Health Sector Nutrition Strategic Plan 2022-2026 does not fully account for climate-induced malnutrition risks. It is only mentioned briefly in the introduction. This is one case in point that the H-NAP has not been mainstreamed. Involved in adaptation efforts through the National Directorate for Environmental Health since the development of NAPA in 2012. This early engagement helped to create an understanding of the need to develop a sectoral adaptation plan. Adaptation programmes appear to involve only a handful of ministries, including MOH, which could explain why the level of awareness of climate change varies across ministries.	Tasked to lead the integration of climate change considerations into health care regulatory frameworks. This will include reviewing all existing guidelines and standard operating procedures to consider climate change and its adverse effects.	One of the national partners of UNDP's Integrated National Financing Framework (INFF) and Financial Diversification. Notably, the programme will assess climate finance budgeting and investments in sectoral and sub-sectoral plans, which was revealed as a critical constraint to the sector in consultations.
National Institute of Health (NIH)	Tasked with the responsibility of researching climate-induced health impacts, assessing the training needs of health professionals, developing training packages, and raising awareness about differential health impacts of climate change on women.		
Ministry of Social Solidarity and Inclusion (MSSI)	Developed the National Disaster Risk Management Policy 2008-2012 through the National Disaster Management Directorate, which is likely not operational at present. It is not mentioned in the CPEIR. This could influence whether disaster risk is sufficiently integrated into current adaptation programmes.		Supported implementation of GEF-funded project on Strengthening Community Resilience to Climate-induced Disasters in the Dili to Ainaro Road Development Corridor.

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Ministry of Foreign Affairs and Cooperation (MFAC)	Ambassador of Climate Change of Timor-Leste is the main point of contact for bilateral cooperation. The majority of cooperation with development partners is around climate change according to MOF. Various health sector agreements have gone through MFAC according to MOH.		One of the national partners of UNDP's Integrated National Financing Framework (INFF) and Financial Diversification. This is likely because of the focus on accessing diaspora financing.
Ministry of Finance	To be included in the interagency and technical working groups supporting the NAP process. However, it is not clear whether these working groups have been established and how their mandates differ from the already established CCWG.	One of the lead entities for the development and coordination of methods for carrying out natural capital assessments and their integration into national accounts.	Plays a role in evaluating the funding requests of different ministries for climate adaptation projects as part of the Budget Review Committee such as to identify climate risks. This requires technical tools and capacity building support. Manages the state budget and thus plays a role in integrating NAP objectives into budgeting processes notably the Budget Call Circular Guidelines. This is a critical role in a country where financial capacity is already limited according to the Ambassador.
Ministry of Education, Youth and Sport (MOEYS)	12 divisions have climate-related mandates, one of them being integrating disaster risk reduction, climate change and environmental education in national school curriculum. This is important for raising public awareness. Efforts will need strengthening according to the NDA.		
Ministry of Higher Education, Science and Culture (MHESC)	Plays a role in developing human and institutional capacities for ecosystem-based adaptation and embedding climate programmes in higher education according to the NAP.		

1.3 Assessing current arrangements

1.3.1 Approach to assessing current arrangements

The main catalysts and constraints to effective climate action were assessed as part of an analysis of the political economy around climate change in Timor-Leste. This provides an understanding of the enabling environment and potential risks and constraints for effectively deploying UK technical and financial assistance, which has informed our final proposals to FCDO. These are presented in Section 1.4.

The catalysts and constraints were identified across eight critical enablers for climate resilience. These eight enablers featured in Arup's Climate Resilient Infrastructure framework (C.R.In) and are based on proposals by the Institute of Civil Engineer's Enabling Better Infrastructure: 12 Guiding Principles for Prioritising and Planning Infrastructure report published in 2019 and the OECD's Climate Resilient Infrastructure: Policy Perspectives report published in 2018. This framework was selected to frame our analysis as it was found to be more holistic than other political economy analysis tools, and allows for more comprehensive consideration of key factors in the types of projects and programs expected to result from this study. Other tools like the World Bank's Climate Change Institutional Assessment or Jakob et al.'s Framework of the Political Economy of Energy and Climate Policy applied to India, Indonesia and Vietnam each only focus on one of the eight enablers that the C.R.In framework covers. Arup has used the framework on another UK FCDO study in the Philippines, which demonstrated its usefulness in unpacking key issues in programme delivery in a development context.

The eight enablers are presented below, together with the score definitions. Each factor has been assigned a 1-3 scoring, with 1 being furthest to best practice and 3 being closest to best practice. The scorings are based on best practice definitions, which Arup has tweaked to be applicable to all sectors more broadly, not just infrastructure. Table 5 below provides an overview of the definitions with further details provided in Annex B.

Table 5: Overview of eight critical enablers from Arup's C.R.In framework with definitions applicable to all sectors

Enablers	Main criteria	Scoring – 1 (furthest from best practice)	Scoring – 2	Scoring – 3 (closest to best practice)
Institutional architecture	- Cooperation - Decision-making - Responsibilities	- Minimal - Limited to few ministries and resilience not a priority - Unidentified or unclear	- Could be more effective - Collective and resilience sometimes informs planning and budgeting at all levels - Clearly identified but not fully accountable	- Effective - Collective and shared priority and resilience systematically informs - Clearly identified and fully held accountable
Legal and regulatory frameworks	- Frameworks - Enables climate finance - Use of data	- No strong legal mandate - Needs strengthening to create private sector finance market - Not informed by latest data	- Links to climate change - Good environment, but not mobilised to full potential - Informed by latest data, but not adapted to local context	- Climate change focused frameworks - Frameworks integrate resilience and attracts climate finance - Informed by latest data that is adapted to local context
Policy, planning and strategic environment	- Policy coherence - Coordination - Infrastructure planning	- Fragmented policy goals - Not well-coordinated - Infrastructure-related frameworks, plans and masterplans not informed by climate goals	- Some overlapping climate policy goals - Good coordination across administrative boundaries, but not across sectors or vice versa - Sometimes informed by climate goals	- Consolidated policy goals - Good coordination - Infrastructure-related frameworks, plans and masterplans systematically informed by climate goals
Technology uptake, affordability and private-sector financing	- Life cycle and total value - Financial feasibility	- Focus on capital costs with minimal considerations for operational costs - Limited investments in new technologies and risk sharing remains a challenge	- Does not focus solely on capital costs, a life cycle or total value approach sometimes taken - Few investments to-date	- Life cycle and total value approach is consistently taken - Significant investments and investment risks are shared with private sector
Data and information	- Up-to-date - Accessibility - Cross-sectoral	- Outdated climate data and science - Data is difficult to access by relevant government entities - Incoherent planning and budgeting as data availability and quality is inconsistent	- Partially up-to-date climate data and science - Data is accessed by some, but not all - Poor availability and quality of data for some sectors	- Up-to-date climate data and science - Data is easily accessed and informs decision-making - Coherent planning and budgeting due to consistent data
Stakeholder engagement	- Collaboration - Communication	Minimal collaboration between diverse stakeholders	- Some collaboration between diverse stakeholders - Good communication and engagement between levels of government	Effective collaboration between diverse stakeholders

Enablers	Main criteria	Scoring – 1 (furthest from best practice)	Scoring – 2	Scoring – 3 (closest to best practice)
		Limited communication and engagement between levels of government		Strong communication and engagement between levels of government
Human capacity and uptake capability	- Skills - Institutional - Technology uptake	- Limited human capital, skills gaps due to insufficient capacity support - Government entities do not have capacity to enforce and embed climate considerations - Existing technologies are not known, and new technologies are not supported	- Decent human capital, some skills gaps despite capacity support - Government entities at some levels do not have capacity - Existing technologies are new to industry, and some new technologies are supported by industry plans	- Sufficient human capital, with strong capacity support - Government entities at all levels have capacity - Existing technologies are mastered by industry, and new technologies are supported by industry plans
Financial governance	- Understanding climate risk disclosure - Mechanisms - Budget alignment	- Financial governance bodies not aware of climate risks - Tools to assess and disclose climate risks not available. Minimal availability of financial mechanisms - Municipal budget not aligned to climate strategies	- Financial governance bodies have some awareness - Tools are available but not widely used. Limited number of financial mechanisms, though present - Municipal budget sometimes aligned to climate strategies	- Financial governance bodies understand and govern it - Tools are available and widely used. Innovative financial mechanisms are available - Municipal budget systematically aligned to climate strategies

1.3.2 Current climate-related governance assessment

A semi-quantitative, high-level assessment of the current enabling environment for climate resilience across the eight enabling factors is provided in Figure 3 below. Each factor has been assigned a 1-3 scoring, with 1 being furthest to best practice and 3 being closest to best practice. It should be noted that the scores indicate that factor's overall performance, taking into consideration the current enablers that are closest to best practice (catalysts) and evident gaps or observed shortcomings that are furthest to best practice (constraints). The catalysts and constraints were first summarised qualitatively, then scores for each factor were assigned based on overall impression of performance meaning the relative number of catalysts to constraints, their relative significance, and informed by an understanding from our in-country consultants of the political economy outside of climate change.

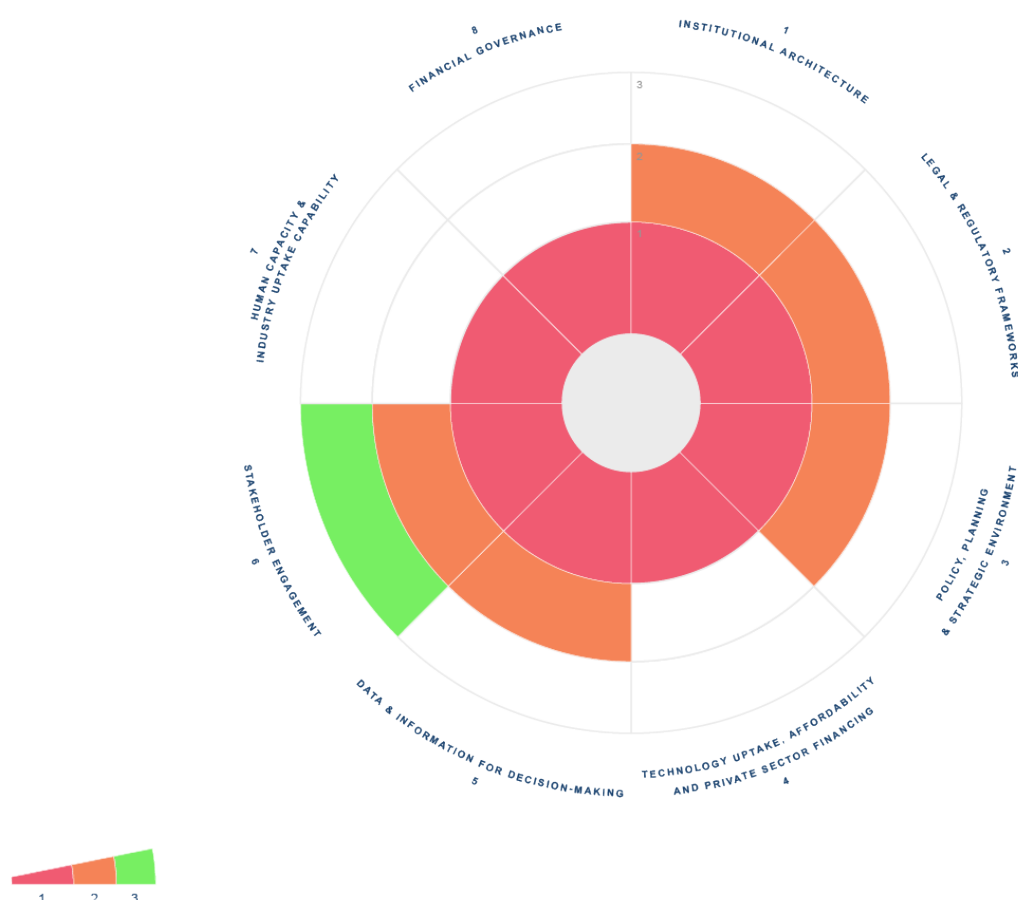


Figure 3: Assessment of the enabling framework for climate resilience in the Timor-Leste

Progress has been made in some areas and further support is required in other areas. The existing catalysts and constraints that form the basis of this assessment have been elaborated below.

1.3.3 Catalysts and constraints

This section provides further detail on the key catalysts and constraints related to climate action in Timor-Leste. The catalysts reflect enablers that Timor-Leste is excelling in or has recently adopted to drive change; these should be celebrated and built upon. The constraints represent evidence gaps or observed shortcomings related to climate resilience in Timor-Leste. The constraints represent key opportunities for change.

1.3.3.1 *Institutional architecture*

Catalyst: The Government has advanced its efforts to formalise the national institutional arrangements for its response to climate change (DRTL, 2022). The National Climate Change Policy defines the division of responsibilities and existing commitments (DRTL, 2022). The institutional architecture for climate change comprises a combination of implementing and coordinating entities. The main authority for the implementation, monitoring and enforcement of climate-related objectives and policies rests with sectoral ministries. The coordinating entities, those elaborated earlier in this section, define the objectives and policies. These overarching policies outline a set of principles for sectoral ministries to have a common reference when developing their instruments, identifying activities and monitoring their implementation.

Catalyst: The Government has access to financial support to formalise the institutional arrangements for climate adaptation at the national, municipal and suco (village) levels (DRTL, 2022). The coordinating entities elaborated earlier in this section assume an interim role regarding climate adaptation, according to the National Adaptation Plan (NAP). The NAP proposes that formal mandates and permanent institutional arrangements are established during the 2020 to 2025 period using GCF Readiness grants, including clearly defining roles and responsibilities for NAP coordination and implementation at all levels. The NDCC and CCWG will have to identify sectoral and vertical coordination mechanisms to be given a legal mandate and to nominate, inaugurate, and convene members for a permanent steering mechanism, among other tasks.

1.3.3.2 *Legal and regulatory frameworks*

Catalyst: The Government intends to develop and pass an innovative climate change focused Decree-Law that will be the legal framework for the country's climate change response (DRTL, 2022). The National Climate Change Policy, which was recently endorsed and published, provides the basis for a new climate change focused national legal framework to be developed in the 2023-2024 period. The binding national legal instrument will strengthen the basis upon which the National Climate Change Policy and upcoming National Climate Change Strategy and Action Plan are implemented. This law is also anticipated to improve coordination and cooperation between public entities and with the private sector, create the legal mandate for establishing the National GHG Inventory, introduce new requirements for assessing and addressing climate-related infrastructure risks, and define new public decision-making and budgetary requirements designed to improve the management of complexity and trade-offs.

Catalyst: There are links to climate change in existing laws, namely the National Constitution, the Environmental Basic Law, and Decree-Law 6/2020 instituting the legal regime for the protection and conservation of biodiversity (DRTL, 2022) (DRTL, 2012) (DRTL, 2020). In the absence of a climate change focused law, there are some existing laws that could directly or indirectly help to elevate climate change as a national priority. Firstly, there is Article 61 of the National Constitution that establishes the fundamental 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' of all Timorese people. Secondly, there is Article 34 and 25 of the Environmental Basic Law that state that necessary measures for climate adaptation and mitigation should be implemented. Specifically, climate adaptation measures are needed to minimise the negative impacts of climate change on biophysical and socioeconomic systems. Lastly, the Decree-Law 6/2020 explicitly establishes the link between climate change and the need to protect and conserve biodiversity.

Constraint: Stakeholders are not required to assess and address climate-related infrastructure risks. Broader environmental considerations are assessed as part of environmental licensing in the infrastructure project lifecycle, but this does not cover climate risk and vulnerability according to a representative of the NPO. The climate change focused decree-law could introduce new requirements for assessing and addressing climate-related infrastructure risks (DRTL, 2022). The climate change law is currently being drafted according to a consultation with NDA. However, it is difficult to determine the timeline that the law could come into effect. The upcoming parliamentary elections in May 2023 is likely a contributing factor to this uncertainty.

1.3.3.3 *Policy, planning and strategic environment*

Catalyst: The National Climate Change Policy was published in 2021 and is the central policy framework for guiding the country's national approach to climate action (DRTL, 2022). The National Climate Change Policy aspires to strengthen coordination between ministries and avoid duplication of efforts and application of outdated climate policy measures. Through a process of inter-ministerial consultation, the policy was developed by reconciling, updating and prioritising climate adaptation and mitigation measures that were in place across different sectors. The National Climate Change Policy will be mainstreamed into future Strategic Development Plans, sectoral policies and plans. In addition, a National Climate Change Strategy and Action Plan will likely be developed to guide implementation of the policy's principles and objectives. For one, the policy's principles must be taken into account in future sectoral policy review processes.

Catalyst: The National Adaptation Plan was published in 2021 and provides the strategic basis for national adaptation priorities and implementation arrangements in Timor-Leste. Supporting this, is an unconditional commitment to operationalise the plan in the updated NDC (DRTL, 2022) (SSE, 2021). The Government has been working on its climate adaptation agenda for several years, starting with the National Adaptation Programme of Action in 2011. The Government started the process to develop the National Adaptation Plan in 2019 to consolidate activities of the National Adaptation Programme of Action with those of the Intended NDC and GCF Country Programme into a single, coherent national programme. The process of developing the plan was informed by vulnerability assessments, national consultation workshops, and close consultations with a range of stakeholders and communities. The plan was developed around seven priority areas for climate adaptation including infrastructure, biodiversity and ecosystem, health, agriculture, water, disaster risk reduction and tourism.

Catalyst: An UNEP-led Technology Needs Assessment (TNA) process that commenced in 2020 is expected to be completed in 2023. The main outputs will be a Technology Needs Assessment report and Technology Action Plan that can be integrated into national planning processes (GEF, 2019). Technologies where there is clear demand from different stakeholder groups including sectoral ministries, private sector, NGOs, international organisations and donors to address the country's mitigation and adaptation priorities will be identified. Stakeholder consultations will be held to understand the demand as well as to foster a sense of ownership over the process. This is an important success factor for the subsequent technology implementation planning phase. Technologies for developing climate resilient infrastructure could be one of needs. It has already been identified in the Post Disaster Needs Assessment (UNDP, DRTL, World Bank, 2021). Technologies for the agriculture and water sectors could also be key needs. It has already been identified in the NAP and the Strategic Development Plan mentions that farming technology is underdeveloped.

Catalyst: Agriculture, aquaculture and water related research and technology is discussed significantly in the NAP (SSE, 2021). The need for technology transfer and adoption and importance of using the most recent, best available science is discussed in the NAP. Several programmes, mainly related to agriculture, aquaculture and water sectors, have been put forth that focus on research and technology development and adoption. Some relate to sustainable practices more broadly while others are adaption focused. This includes the identification and adoption of low-cost and user-friendly technologies for high-impact sustainable agriculture, research into different sustainable aquaculture technologies and associated practices, research and development of technologies that support climate adaptation particularly for agriculture, water resource management, coastal and marine management, and improvement of water management in high-prone drought areas including developing rainfall harvesting technologies.

Constraint: Climate change agenda is not mainstreamed in sectoral policies despite strong climate policies such as the NDC, NCCP and NAP. The translation of top-down climate priorities into sectoral policies appears to be limited. The NAP is an important policy document outlining long-term adaptation priorities, but there is a need for better integration of NAP into sectoral policies according to a consultation with the Ambassador of Climate Change of Timor Leste. There are specific examples for some sectors including some sectors prioritised in the NAP (UNDP and MOF, 2022). One example is water and sanitation, where the importance of adapting the sector is inadequately reflected in the annual action plans of relevant divisions under MPW. The health sector is one exception to this, as the H-NAP was approved in 2022. An increase in mainstreaming efforts of the climate change agenda to other sectors is needed, according to a representative from MOH.

1.3.3.4 *Technology uptake, affordability and private-sector financing (including access to green finance)*

Catalyst: An Integrated National Financing Framework (INFF) has been developed to support the Government in developing financing mechanisms for national sustainable development. Climate financing was one of the priority areas for catalysing strategic investments (UN Joint SGD Fund) (UNDP and DRTL, 2022). The Government and UNDP worked together to develop the INFF through a joint programme that took place from 2020 to 2022. The programme aimed to help Timor-Leste transition into an area of private sector-led inclusive, climate resilient green growth and continue to finance its sustainable development. The INFF process considered four elements including assessments and diagnostics, financing strategy, monitoring and review, and governance and coordination that are important for financial sustainable development objectives. A range of stakeholders across the private sector (e.g. Chamber of Commerce and Industry Timor-Leste), public sector, development partners, NGOs and civil society organisations were consulted in this process. The main findings and recommendations developed from this work were published in 2023 in the INFF for Sustainable Development of Timor-Leste: Summary for the Policy Makers report, which includes recommendations for the Government to address the key challenges against increasing national and international private finance.

Catalyst: The Blue Economy Financing Roadmap is being developed and will likely identify innovative financing options to support blue economy opportunities. The blue economy an important contributor to climate adaptation and resilience in Small Island Developing States (SIDS) like Timor-Leste (UNDP, 2022). Blue economy opportunities like mangrove rehabilitation and seagrass planting protect marine ecosystems and shorelines and at the same time offer sustainable sources of income. The UN Joint SDG Fund and UNDP are providing technical and financial support to develop Timor-Leste's first Blue Economy Financing Roadmap. The roadmap will explore the potential for developing a new Blue Economy Financing Facility that can provide incentives, grants, concessional loans and guarantees to develop strategic blue economy projects, the potential to develop innovative debt financing instruments (e.g. blue bonds) and other sources of finance (e.g. blue carbon markets). Timor-Leste could follow the example set by Seychelles, which become the first country to issue a sovereign blue bond to support sustainable marine and fisheries projects in 2018. The bond raised US\$15 million from international private investors (WB, 2018). However, Timor-Leste does not have a sovereign credit rating yet, which suggests there are constraints to be addressed (Economist Intelligence Unit, 2017).

Catalyst: Timor-Leste has a strong interest in accessing climate finance. (WaterAid, 2017). It is known that GCF has a strong private sector focus especially through its Private Sector Facility (PSF). The PSF's main aim is to engage both the local and global private sector to support climate mitigation and adaptation projects (GCF, 2019). The country has accessed GCF finance since it developed its first GCF programme in 2019. The three ongoing GCF projects on enhancing early warning systems, safeguarding rural communities, and promoting community-based landscape management are all grant funding to the public sector (GCF).

Constraint: Limited access to climate finance for the private sector. So far, Timor-Leste has only accessed climate financing from GCF for public sector-led projects. This is a missed opportunity to access private sector focused financing from GCF namely through its Private Sector Facility. This could be limited for several reasons including lack of GCF accredited entities operating in Timor-Leste, prevalence of foreign-owned banks and underlying business environment constraints (GCF, 2019).

Constraint: While progress has been made to improve the overall investment climate, more remains to be done. The Timor-Leste Government has taken steps to improve the investment climate such as by establishing an open trade and investment regime and streamlining the business registration process, but more remains to be done. TradeInvest have mainly been focused on developing and administering tax incentives to attract foreign investment. However, it is not clear how effective these incentive schemes have been. It is important to consider the opportunity cost here as implementing incentive schemes would reduce the already limited institutional capacity in the country, which could be geared towards investment facilitation and coordination activities (ADB, 2015). Furthermore, there is a need for a formal public-private platform to identify and overcome private sector issues and more well-defined mandates for investment-related government entities. Currently, both TradeInvest and Ministry of Tourism, Trade and Industry both have responsibilities around coordinating private sector development efforts.

Constraint: Climate expenditures to develop scientific, technical and societal capacity have been made in most sectors, but the amount has varied significantly. A significant amount has been spent during the 2018-2021 period on LiDAR surveying and spatial mapping. USD 301,000 was spent in 2021, though more than USD 700,000 and USD 4,000,000 were spent in previous years. For the environment sector, USD 87,310 was spent in 2021 on information and database development including on developing, managing and operating meteorological, climatology and seismology surveillance systems. For agriculture, USD 39,010 was spent in 2021 on research to develop new seeds and varieties of rice, maize, sweet potatoes, and other crops to be more adapted to climate change conditions. Additionally, USD 4,350 was spent in 2021 on the production of organic fertilisers and biogas. No science or technology related expenditures were made for aquaculture during the 2018-2021 period. For the water sector, no expenditures were made during the 2018-2021 period to support planning, researching and design of flood control despite the water sector being one of the focus areas for adaptation-related research and technology deployment. Most of the expenditures were made on actual water and sanitation infrastructure development (UNDP and MOF, 2022).

Constraint: Lack of a monitoring and evaluation framework to assess climate finance according to the Ambassador of Climate Change of Timor-Leste. Currently, the Timor-Leste Government does not have a monitoring and evaluation (M&E) framework to assess what the impact of climate finance has been. This is a missed opportunity to inform and hence improve future climate finance projects. Projects have been implemented, but without the right framework or tools it is difficult to assess the real impacts on communities and the contributions to national development.

1.3.3.5 Data and information

Catalyst: A USD 21.7 million project will establish end-to-end climate information services and multi-hazard early warning systems in Timor-Leste (UNOPS, 2022) (UNEP, 2021). The project commenced in 2021 and is being led by UNEP, with funding from GCF. It is expected to be completed by 2027. There is a critical need for robust climate data, information and multi-hazard early warnings in Timor-Leste. The limited availability of relevant climate data was identified as a significant challenge in the NAP (SSE, 2021). This project seeks to address this by building in-country capacity for science-based and data-driven adaptation planning and disaster risk reduction. In one example, the project will introduce impact-based forecasting and forecast-based financing, which are innovative mechanisms for early warning. In impact-based forecasting, the impacts of extreme weather events on people and assets are communicated, in addition to their likelihood of occurring. Forecast-based financing refers to the access to humanitarian funding based on in-depth forecast information and risk analysis to anticipate natural disasters and hence, reduce their impact.

Catalyst: The National Adaptation Plan is based on existing vulnerability and climate risk assessments in Timor-Leste. Over the next few years, more detailed vulnerability and climate risks assessments will be carried out to update the plan (SSE, 2021). Several assessments have already been carried out in Timor-Leste, providing a good evidence base to initiate its adaptation work. Some examples include a national coastal vulnerability assessment, a coastal ecosystem assessment and mapping, a national hazard risk assessment and an assessment of groundwater. These assessments have provided a good data and information foundation, though the NAP acknowledges that more can be done and identifies actions that would deepen the understanding of vulnerability and climate risk in the country. Actions such as carrying out detailed vulnerability assessments to fill knowledge gaps in certain sectors and regions, undergoing a comprehensive study of climate risks to infrastructure, developing and adopting a common methodology for these assessments, establishing a central database of national and suco-level vulnerability and risk assessments, and carrying out new assessments to update the priorities of the second NAP.

Constraint: Data on economic loss caused by climate change is not being collected and shared. It is promising that climate budget tagging will be introduced as part of the public financial management (PFM) system to better capture current climate expenditures. However, data on how much expenditure is necessitated based on the economic cost of climate change is absent. This data is needed to understand whether current expenditures stack up against what is needed to avoid significant economic damage. This could evidence the case for accelerating climate-related investment (UNDP and MOF, 2022). Economic losses from climate change could reach as much as 10% of Timor-Leste's annual GDP by 2100, making it one of the worst hit in the Pacific, according to ADB (ADB, 2013).

1.3.3.6 *Stakeholder engagement*

Catalyst: Informed and effective participation is one of the seven guiding principles of the National Climate Change Policy. These principles must be considered in the development of future national and sectoral climate policies (DRTL, 2022). One of the guiding principles of Timor-Leste's central climate change policy focuses on stakeholder engagement. It considers the importance of enabling stakeholder participation in decision-making and enabling action at all levels: national, municipal and suco level. The role of community and municipal government are highlighted in the National Climate Change Policy, specifying community-based adaptation and the integration of climate adaptation and mitigation measures in municipal level development plans and budgeting processes as practical examples of this principle. In another example, the actual development of the National Climate Change Policy involved diverse stakeholder participation. Representatives from each government ministry and representatives from the private sector, academia and civil society through the Climate Change Working Group were brought together to participate in a national validation workshop that resulted in a final list of high-level prioritised policy statements, on which the National Climate Change Policy was developed. This was also mentioned in consultation with NDA, that active participation and involvement of government entities in policymaking is very important in the country.

Catalyst: Timorese local customs known as Tara Bandu provide a key entry point for strengthening engagement with and involvement of local communities in resilience building efforts (Oxfam, 2015) (SSE, 2021). Tara Bandu are uniquely Timorese customary rules that enforce peace and reconciliation, environmental protection and management of natural resources, and community welfare (Belun and TAF, 2013). There is a historical link between environmental issues and Tara Bandu that predates colonial times and has recently been revitalised since Timor-Leste gained independence from Indonesia. Communities in Timor-Leste have established an environmental management regime under Tara Bandu, which includes forest conservation areas, fishery no-take zones, bans on certain types of destructive fishing methods, and prohibitions on harvesting of certain species, among other examples. The NAP recognises the importance of Tara Bandu as an entry point for community-led climate adaptation where communities will be encouraged to plan and implement locally appropriate adaptation measures.

Constraint: Community-based adaptation approach through Tara Bandu needs reinforcing to be more effective in practice. There are many examples of why Tara Bandu has not been effective, one of which is burning of land according to the Ambassador of Climate Change of Timor-Leste in consultation. The customary believe is that if you burn the soil, you destroy the environment and the biodiversity, so you impose Tara Bandu, however at the end of the day the law is breached and people continue to burn soil. Therefore, it is suggested to work further in the approach of Tara Bandu by reinforce it with the concept beliefs of people in “Uma Lulik” or Sacred House. Culturally, Timorese people have strong faith in the UMA LULIK. The practise of the Faith of the UMA LULIK can be an approach to integrate it with Tara Bandu. For example, in the Municipality of Lospalos, where people have a high conscience of protecting the environment and not burning of land - this is because of their strong tradition of faith in the things they consider as “LULIK” or sacred or in the UMA LULIK in which they believe that if you burn someone's land or property, the sacred house will be searching for your way or it is like you are cursed.

1.3.3.7 *Human capacity and uptake capability*

Catalyst: Timor-Leste has made significant development process over the last two decades, including building institutional and human capacity. It will continue to do so with capacity building activities being prioritised in key climate policies (DRTL, 2022). With support from international partners, there has been progress such as training 15 public officials on vulnerability analysis at the municipal level, building capacity to generate and use climate risk information in rural communities, introducing climate-related topics in all levels of education and carrying out climate-related research projects (UNDP). Moving forward, capacity building remains a priority for the country and its importance is reflected in key climate policies. For one, long-term capacity building is one of the guiding principles of the NCCP, which is likely to have an influence on future climate-related sectoral policies and programmes. Another example is that human capacity activities have been identified in each of the priority programmes of the NAP. This includes developing technical capacity in public and private sector to integrate climate resilience considerations in all stages of infrastructure development, preparing health workers and institutions on prevention and response mechanisms for climate-related health issues, promoting sustainable fishing methods, promoting integrated sustainable land management practices, promoting education and training agricultural workers on climate

smart agriculture techniques, developing integrated agroforestry and watershed management, and improving community (including vulnerable groups such as women and children) capacity to prepare for and respond to climate-induced natural disasters, among other activities identified in the NAP.

Constraint: Institutional and human capacity needs to be built to support the development of successful project proposals, budget allocation and utilisation for, and implementation of climate programmes and projects. Human resources was identified as one of the critical constraints to climate action and implementation of H-NAP in consultation with MOH, MOF, the Ambassador and NDA. NDA itself noted that the authority faces a lack of institutional and human capacity as it is newly established. It is likely that constraints are interlinked, and human resource constraints contribute to budget allocation limitations and implementation issues around managing climate programmes and projects. Capacity support is needed for climate considerations to be made upfront such as during budgeting and procurement processes, improve budget utilisation for climate projects by sectoral ministries, and for professionals such as health and agricultural workers and communities to be adequately trained to understand climate-induced issues and relevant climate action. One solution could be capacity building support to government staff to come up with project ideas and develop proposals to accessing funds according to the Ambassador.

Constraint: There is also a need for capacity support for climate planning, analysis, modelling and projection according to the Ambassador of Climate Change of Timor-Leste. Short-term capacity building support to formulate their sectoral policies and plans and integrate climate change plans into their sectoral policies and programmes is needed. The institutions understand the documents and the information regarding climate change; however, to translate it into their sectoral plans is what is still missing or having difficulties with. Reliance on international experts, not enough knowledge transfer for long-term sustainability. Can look into providing scholarships which focuses on climate modelling and analysis. Up to date, Timor-Leste have been relying on international experts, this is unsustainable and ineffective in knowledge transfer.

1.3.3.8 *Financial governance*

Catalyst: A climate risk and vulnerability assessment for a major infrastructure project has already been conducted, which is a promising step towards mainstreaming climate risk considerations in all infrastructure investments (ADB). The assessment was conducted for the upgrade and extension works to the runway at Timor-Leste's main international airport – Presidente Nicolau Lobato International Airport (PNLIA), which resulted in the ADB providing USD 1.81 million in climate financing as part of the total USD 131 million that was loaned to the Government. The amount of climate financing has been estimated for specific adaptive measures that respond to the climate risks identified in the assessment. Climate risk assessments ensure targeted adaptive measures are identified and financed.

Catalyst: There are two main public funds available, the Consolidated Fund of Timor-Leste (CF-TL) and the Infrastructure Fund, for funding climate-related projects (UNDP and MOF, 2022). In the first three quarters of 2021, USD 661,273 worth of CF-TL funding went to projects of high relevance to climate change objectives in the Education, Social Inclusion, Environment and Agriculture sectors. Funding has been used for humanitarian aid to families who are victims of natural disasters and implementing permanent community forest and mangrove nurseries known as Maubara, as just two examples. In this same period, USD 301,000 was channelled from the Infrastructure Fund into projects of high climate relevance in the Rural Development sector. USD 592,000 was budgeted for projects of high climate relevance in the Roads and Bridge sector, such as for protecting Dilor Bridge and carrying out emergency construction of new roads, but it is difficult to conclude whether the funds have been spent based on publicly available information.

Catalyst: Grants are available through the Green Climate Fund (GCF) for the development and implementation of key climate strategies and plans (DRTL, 2022) (SSE, 2021). NTimor-Leste submitted its first GCF Country Programme in 2019, outlining its climate strategy and priority projects to guide future engagement with the GCF. Since then, Timor-Leste has successfully launched three climate adaptation and mitigation GCF projects that have a combined project value of USD 96.5 million (GCF). GCF has funding facilities that the Government can tap into for its climate strategy and plan development and operationalisation. One of the main ones is the GCF Readiness facility, which the NDCC has been accessing grants from to fund its NAP Support Programme (NSP). For example, the funds have been used to develop the monitoring, evaluation, reporting and learning framework for the NAP, which is currently being

finalised. The Government also intends to use the funds to develop the National Climate Change Strategy and Action Plan and carry out in-depth assessments to revise the NAP in the next few years.

Catalyst: Over the years, the Timor-Leste Government has made a sustained effort to reform financial governance with support from international organisations, though constraints remain (WB and MOF, 2018). This support has taken the form of integrated multi-donor programmes, such as the World Bank-led Planning and Financial Management Capacity Building Programme, and country-led targeted assistance provided by the EU Budget, in one example. These programmes have mainly focused on fiscal reform to diversify revenue sources and support fiscal sustainability, performance management reform to tackle the capacity gap among PFM professionals, and program-based budgeting reform to align budgeting with sectoral planning and programme development. The country has now developed a public financial management (PFM) system which scores good practice in nine out of 31 indicators as part a PFM assessment by the World Bank and the Ministry of Finance (MOF) in 2018-2019. Among the areas which scored relatively higher include external scrutiny and audit; budget reliability; and accounting, recording and reporting. Some constraints affecting climate-related financial governance will be elaborated in the next section.

Constraint: Lack the capacity with access the Least Developed Countries (LDC) Fund and overcoming the procedures in place to access according to the Ambassador of Climate Change of Timor-Leste. LDCF support helps countries implement National Adaptation Programs of Action (NAPAs) – country-driven strategies for addressing their most urgent adaptation needs. It also supports the implementation of National Adaptation Plans (NAPs), and the Least Developed Countries work program under the UNFCCC. As a member State of LDC, there are various financing available for Timor-Leste to access.

Constraint: Market-based disaster risk insurance solutions may be limited. As an ASEAN member state, Timor-Leste is part of the Southeast Asia Disaster Risk Insurance Facility (SEADRIF) which aims to improve access to pre-arranged financing through market-based mechanisms for responding to disasters in Southeast Asian countries (World Bank). Significant efforts are required as currently there are no contingent credit lines, consumer-level or sovereign risk transfer tools and the insurance industry in Timor-Leste is small (GIZ, 2020).

Constraint: Financial support for climate resilient infrastructure tends to be reactive to specific climate-induced events rather than preventative. There is a high-volume of humanitarian support distributed in the aftermath of natural disasters (UNDP and MOF, 2022). For example, funds from the Infrastructure Fund to the roads and bridges sector have primarily been channelled towards emergency response. In another example, the water and sanitation sector has also mainly received reactionary emergency funding. There is a missed opportunity to direct funds into strengthening existing infrastructure such as by allocating an adequate operations and maintenance budget or developing climate resilient infrastructure from the outset.

Constraint: Some actions identified in the NAP to implement priority programmes and projects have not yet been integrated into budgetary planning. Adaptation priorities have been outlined in the NAP, though specific actions needed to achieve these have not yet been integrated into budgetary planning (International Monetary Fund, Democratic Republic of Timor-Leste: Selected Issues, 2022). For one, the State Budget 2022 did not include any investment plans related to climate change infrastructure (International Monetary Fund, Democratic Republic of Timor-Leste: Selected Issues, 2022). Secondly, no budgetary allocations were made for planning, researching and designing flood control mechanisms over a four-year period.

Constraint: Under-utilisation of allocated budgets for climate-related programmes and projects. Several sectoral ministries have reported actual expenditures for climate-related programmes and projects that are significantly lower than budget allocated (UNDP and MOF, 2022). One of the most notable discrepancies has been with funds allocated from the Infrastructure Fund. In 2019, \$324,000 of the \$3,748,000 budgeted from the fund was spent. Another example is with the Environment sector. In 2021, \$537,931 of the \$2,240,290 budgeted from CF-TL was spent.

1.4 Assessment outcomes from WP2

There are four key climate-related policies at the national level that are helping to elevate the national importance of the climate change agenda. These are the Strategic Development Plan 2011-2030, National Climate Change Policy, updated Nationally Determined Contribution, and National Adaptation Plan. These policies are important references for the country's adaptation priorities and areas of technical and financial support urgently required.

Climate adaptation has been a relatively important focus area for the country where adaptation programmes and projects have been pursued for over seven years. The process of developing the National Adaptation Plan helped to consolidate different initiatives into a coherent plan with clear priorities. It also helped to reinvigorate ministries around adaptation work and instil its importance for the country. However, while the importance of climate change is recognised at the strategic level, engagement with key ministries and agencies under this study, such as Ministry of Health and the National Designated Authority for Combatting Climate Change, among others, revealed that there is still relatively low engagement with and ownership of activities under the NAP.

There are seven government entities that are key actors in Timor-Leste's climate-related governance. These entities have one of two functions: oversight/high-level decision-making or coordination. This includes, for example, the Secretariat of State for the Environment (SSE) oversees the development and implementation of the NAP. The National Directorate for Climate Change (NDCC) under the SSE coordinates NAP implementation such as through the Climate Change Working Group (CCWG) which NDCC chairs.

Additionally, there are 15 sectoral ministries and public entities that also have climate-related legal, financial and institutional arrangements that either apply across sectors or are sector specific. The key ministries to lead on implementation on adaptation priorities in the NAP include the Ministry of Agriculture and Fisheries (MAF), Ministry of Public Works (MPW), SSE, and Ministry of Health (MOH).

Institutional architecture. The government has put in place the formal institutional arrangements to support its response to climate change, and does have some access to financial support to support these arrangements at the national, municipal and suco (village) levels.

While the institutional arrangements have been put in place, there is still work required to strengthen the coordination that adaptation will require and to ensure that ministries have a clear understanding of roles and responsibilities.

Legal and regulatory frameworks. Many of the legal and regulatory frameworks in Timor-Leste make reference to climate change, including the National Constitution, the Environmental Basic Law, and Decree-Law 6/2020 instituting the legal regime for the protection and conservation of biodiversity. The government is also working on an innovative climate change focussed Decree-Law which will provide the legal framework for the country's climate change response.

Despite these frameworks, there are still a number of areas where there are no requirements, or where enforcement mechanisms are lacking. For instance, there is no requirement for key stakeholder ministries to assess and address climate-related infrastructure risks. There remains a gap overall around legal and regulatory enforcement mechanisms that would give weight to the existing legal frameworks.

Policy, planning and strategic environment. The Government of Timor-Leste has developed a number of very comprehensive and holistic strategies and policies to respond to climate change impacts. These include the NCCP Policy, published in 2021, which is the central policy framework for guiding the country's national approach to climate action. The 2021 NAP provides the strategic basis for national adaptation priorities and implementation arrangements in Timor-Leste. Supporting this, is an unconditional commitment to operationalise the plan in the updated NDC.

Despite these comprehensive strategies, the corresponding implementing ministries have not mainstreamed climate change into their sectoral policies. Stakeholder consultations revealed a need to translate high-level adaptation priorities into sectoral plans and strategies as MOH had done to develop H-NAP.

Technology uptake, affordability and private-sector financing (including access to green finance). An INFF has been developed to support the Government in developing financing mechanisms for national sustainable development, with climate financing identified as a priority area. The government is also

developing a Blue Economy Financing Roadmap, which will help to identify innovative financing options in the blue economy that could contribute to climate adaptation and resilience.

These initiatives represent a strong interest on the part of the government in accessing climate finance to support sustainable, diversified economic growth that can help offset declining oil and gas revenues. However, access to private-sector financing remains limited in many areas, which is a key limitation in Timor-Leste's ability to deliver on its development goals.

Data and information. There has been significant investment in developing data and information to inform climate adaptation action in Timor-Leste, including a USD 21.7 million project will establish end-to-end climate information services and multi-hazard early warning systems. Vulnerability and risk assessments have also been used to inform the NAP, and the intention is to develop more detailed assessments in order to update the plan.

Data gaps remain, particularly around economic losses caused by climate change. There is a need to develop more of an evidence base around climate risks and vulnerability at a more granular scale and the potential economic cost caused by climate-induced impacts.

Stakeholder engagement. The NCCP identifies informed and effective participation as one of the seven guiding principles, which means that stakeholder engagement must be considered in the development of future national and sectoral climate policies. There are also opportunities to involve local communities in resilience building efforts through strengthened engagement based on Tara Bandu, a Timorese custom that can be used to enforce resilience and conservation strategies agreed by the community.

Human capacity and uptake capability. While Timor-Leste has made significant development process over the last two decades, including building institutional and human capacity, continued and sustained efforts are required in order to support the prioritisation, budget allocation and utilisation for, and implementation of climate programmes and projects.

Conversations with stakeholders revealed a need for support to civil servants around sectoral policymaking, embedding climate considerations in processes, and managing programmes and projects, as well as professionals who may require specialised training for certain adaptation initiatives.

Financial governance. Over the years, the Timor-Leste Government has made a sustained effort to reform financial governance with support from international organisations, which has allowed it to access more international funding. The government of Timor-Leste has two main public funds available, the Consolidated Fund of Timor-Leste (CF-TL) and the Infrastructure Fund, for funding climate-related projects. In addition, grants are available through the GCF for the development and implementation of key climate strategies and plans.

Despite the improved financial governance, priority programmes and projects from the NAP have not yet been integrated into budgetary planning. At the same time, budgets allocated for climate-related projects and programmes are under-utilised. Some of this is likely due to the reactive nature of financial support for climate resilient infrastructure which is put towards response to specific climate-induced events rather than towards building climate resilience.

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3. Annexes

3.1 Annex A: Climate-related institutional, policy, legal and financial arrangements

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Council of the Ministers	All <u>National Adaptation Plan</u> states that the constitutional powers and responsibilities of the Council of Ministers applies to the NAP, giving it the power to define the guidelines of climate adaptation related policies and approve plans (SSE, 2021) <u>National Adaptation Plan</u> also states that the Council of the Ministers is to hold the Secretariat of State for the Environment accountable for implementation of the NAP as well as provide guidance and direction when needed (SSE, 2021)	All - Council of Ministers approved a legislative package, composing of four draft Decree-Laws. This includes <u>Decree-Law No. 42/2022 establishing a National Designated Authority for Combating Climate Change</u> that will provide a coordinating body for the Timor-Leste Government and Green Climate Fund and <u>Decree-Law No. 41/2022 for creating a National Environmental Licensing Authority</u> that seeks to harmonise the existing legal regime on environment licensing (DRTL, 2022) <u>National Adaptation Plan</u> recommends establishing a Government Decree-Law to support effective implementation of the NAP and integration of climate adaptation into relevant sectoral policies, plans and budgets. This would require approval from the Council of the Ministers (SSE, 2021)	All <u>National Adaptation Plan</u> recommends that technical tools and support are provided to the Council of Ministers, as well as the Budget Review Committee (consisting of the Prime Minister, Minister of Finance and other key ministers) for evaluating the funding requests from climate adaptation aspects. This could include support to identify climate risks in relation to proposed projects (SSE, 2021)
Ministry of Finance	All <u>National Climate Change Policy</u> recognises that the Ministry of Finance has a critical role to play in policy implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Ministry is to be included in the interagency working group and technical working groups, which are the	All <u>Decree-Law No. 6/2020 instituting the legal regime for the protection and conservation of biodiversity</u> states in Article 10 that the Ministry of Finance will be one of the government entities responsible for the development and coordination of methods for carrying out natural capital assessments and their	All <u>Nationally Determined Contribution</u> mentions the Ministry of Finance will supervise the Contingency Fund that intends to support affected communities and vulnerable persons respond to natural disasters and climate change impacts (UN, 2021) (DRTL, 2022)

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
	second tier of the institutional arrangements for the NAP process (SSE, 2021)	integration into national accounts (DRTL, 2020)	<u>National Adaptation Plan</u> identified several entry points for aligning existing budgeting processes with NAP objectives. For example, the Ministry of Finance could incorporate NAP priorities and a monitoring plan into Budget Call Circular Guidelines for incorporating climate change expenditures in budget submissions, among others (SSE, 2021) <u>National Adaptation Plan</u> also identifies the Ministry of Finance co-responsible for mobilising international and domestic sources of funding and ensuring the release of funds for approved adaptation projects (SSE, 2021)
Ministry of Foreign Affairs and Cooperation	All <u>National Climate Change Policy</u> recognises that the Ministry of Foreign Affairs and Cooperation has a critical role to play in policy implementation (DRTL, 2022)		All <u>Integrated National Financing Framework (INFF) and Financial Diversification</u> in the name of a joint programme that is being led by the United National Development Programme, Office of the Prime Minister, and Ministry of Foreign Affairs and Cooperation. Some examples of the programme's aims include to develop a climate finance roadmap, assess climate financing capacity, and assess climate finance budgeting and investments in sectoral / sub-sectoral plans (UNDP)
 Secretariat of State for the Environment Education Health Null Social Inclusion Environment Culture and heritage Null Roads and bridges Null Water and sanitation Null	All - Oversight of the country's <u>Nationally Determined Contribution</u> falls under the mandate of the Secretariat of State for the Environment under the Coordinating Minister for Economic Affairs (DRTL, 2022) <u>Nationally Determined Contribution</u> states that different Directorates will look over different sustainable development principles. For example, the National Directorate for Climate Change and the National Directorate for Biodiversity that are both under the Secretariat will	All <u>Decree-Law No. 26/2012 establishing the Environmental Basic Law</u> is the framework for environmental policy and its guiding principles for the conservation and protection of the environment and sustainable use of natural resources. It includes a number of provisions that are relevant to climate change policy. For example, Article 25 states that the State shall establish an integrated management plan for coastal areas including measures necessary for climate adaptation. Article 34 says that the State shall	All <u>National Adaptation Plan</u> identifies the Secretariat of State for Environment co-responsible for mobilising international sources of funding and ensuring the release of funds for approved adaptation projects (SSE, 2021)

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector Null	look over measures related to the precautionary principle and the biodiversity protection principle respectively (DRTL, 2022) 1) Education - Centre for Environmental Education and Information and National Directorate for Climate Change have climate-related mandates including coordinating the development of national environmental education policy, incorporating climate change into primary and secondary school curricula and developing resources to support education professionals teach about climate change impacts as stated in the National Adaptation Plan and under the guidance of National Directorate for Climate Change and Ministry of Education, Youth and Sport (UNDP and MOF, 2022) 3) Social inclusion - National Directorate for Climate Change plans to establish a focal point on gender and climate change (UNDP and MOF, 2022) 4) Environment 11 divisions have climate-related mandates, the key ones being providing strategic development and policy guidance related to managing environmental impacts of climate change, disseminating information on protection and conservation of biodiversity resources, and increasing national capacity to access Green Climate Fund (UNDP and MOF, 2022)	implement measures necessary for climate adaptation and mitigation in terms of GHG emissions reduction and removal by carbon sinks, and minimising the negative effects of climate impacts on biophysical and socioeconomic systems (DRTL, 2012) 1) Education Null 3) Social inclusion Null 4) Environment Null	1) Education - Consolidated Fund of Timor-Leste (CF-TL) has funded some of the Secretariat's climate-related initiatives for education including the development of national environmental education policy and the operation of Green School, which is a programme that promotes environmental stewardship among school students (DRTL, 2022) 3) Social inclusion Null 4) Environment - CF-TL has funded some of the Secretariat's climate-related activities like implementing integrated vulnerability assessments at the sucos (or village) level, operating the Tara Bandu programme and verifying project locations as part of environmental permit issuance. Tara Bandu refers to the term used to describe traditional community customs (UNDP and MOF, 2022) (CTC) Enhancing human resources, systems and procedures in Timor-Leste to effectively engage with the Green Climate Fund is one of the key climate

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
			financing programs in progress. It is implemented by the National Directorate for Climate Change and the General Directorate for Environment under the Secretariat (UNDP and MOF, 2022)
 Ministry of Education, Youth and Sport Education Health Null Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector Null	1) Education <u>National Climate Change Policy</u> recognises that the Ministry of Education, Youth and Sport has a critical role to play in policy implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Ministry is to be included in the interagency working group and technical working groups which are the second tier of the institutional arrangements for the NAP process (SSE, 2021) 12 divisions under the Ministry have climate-related mandates, the key ones being developing new policies on cross-cutting climate change and environmental education and implementing and monitoring the inclusion of disaster risk reduction, climate change and environmental education in national school curriculum (UNDP and MOF, 2022)	1) Education Null	1) Education CF-TL has funded several climate-related initiatives including the development of an agroecology-based school garden programme, promoting school environmental activities, and providing students emergency support against natural disasters (UNDP and MOF, 2022)
  Ministry of Higher Education, Science and Culture Education Health Null Social Inclusion Null Environment Null Culture and heritage Roads and bridges Null Water and sanitation Null	1) Education <u>National Adaptation Plan</u> identifies its role in developing human and institutional capacities for ecosystem-based adaptation, and embedding climate change programmes in higher education (SSE, 2021) - Four divisions under the Ministry have climate-related mandates, the key ones being providing strategic development and policy guidance for adapting higher education sector to the impact of climate change and embedding climate awareness into tertiary	1) Education Null	1) Education Null

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Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector Null	interagency working group and technical working groups which are the second tier of the institutional arrangements for the NAP process (SSE, 2021) • <u>National Adaptation Plan</u> states the ministry will lead two priority programmes for the health sector. The first is on integrating climate change considerations into health sector planning. The second is on improving the health sector's capacity for managing climate risks (SSE, 2021) • Six divisions under the Ministry have climate-related mandates, the key ones being incorporating climate induced vulnerabilities in health sector policies and strategies, and conducting research on localised climate-related health impacts (UNDP and MOF, 2022) • <u>Nationally Determined Contribution</u> outlines the country's unconditional commitment to implementing the overarching objectives to the <u>National Health Adaptation Plan</u>, though specific elements will be condition on securing technical support and financing (DRTL, 2022) (UNDP and MOF, 2022)	procedures to consider climate change and its adverse effects (UNDP and MOF, 2022)	
National Institute of Health Education Null Health Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null	2) Health • Tasked with the responsibility of researching climate induced health impacts, assessing the training needs of health professionals, developing training packages for them to assess climate-related health impacts, and raising awareness about differential health impacts of climate change on women (UNDP and MOF, 2022)	2) Health Null	2) Health Null

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector Null			
Secretariat of State for Equality and Inclusion Education Null Health Null Social Inclusion Environment Null Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector Null	3) Social inclusion <u>National Climate Change Policy</u> recognises that the Secretariat of State for Equality and Inclusion has a critical role to play in policy implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Secretariat is to be included in the interagency working group and technical working groups which are the second tier of the institutional arrangements for the NAP process (SSE, 2021) - Two divisions under the Secretariat have climate-related mandates including providing technical assistance to ministries and agencies, raise awareness about gendered impact of climate change, and providing strategic and political guidance for addressing gendered impact of climate change (UNDP and MOF, 2022) <u>Nationally Determined Contribution</u> outlines the Secretariat's role in supporting and coordinating district-level gender working groups that will assess the climate change, gender and wider social inclusion nexus for its integration within planning processes (DRTL, 2022)	3) Social inclusion Null	3) Social inclusion Null
Ministry of Agriculture and Fisheries Education Null Health Null Social Inclusion Null	All <u>National Climate Change Policy</u> recognises that the Ministry of Agriculture and Fisheries has a critical role to play in policy implementation (DRTL, 2022)	All <u>Decree-Law No. 6/2004 on the legal regime for the management and regulation of fisheries and aquaculture</u> establishes and regulates the importance of biodiversity	



Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Environment Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Petroleum Null Tourism Private sector Null	- National Adaptation Plan states that the Ministry is to be included in the interagency working group and technical working groups which are the second tier of the institutional arrangements for the NAP process (SSE, 2021) 4) Environment - Three divisions under the Ministry have climate-related mandates, the key ones being managing and protecting forests, operationalising the Maubara permanent nurseries and community nurseries of forests and mangroves, and reforestation and rehabilitation of degraded areas (UNDP and MOF, 2022) 13) Agriculture - Four divisions under the Ministry have climate-related mandates, including conducting adaptation research for local crops, constructing flood protection barriers and standardising Agricultural Zones, using and conserving agricultural waste, producing organic fertilisers and biogas, providing climate adaptation training to farmer groups and Farmers Groups Associations, and developing and sharing climate sensitive agricultural technical information (UNDP and MOF, 2022) 15) Tourism - One division under the Ministry has the climate-related mandate to develop and maintain ecotourism potentials in protected areas (UNDP and MOF, 2022)	and conservation (DRTL, 2004) 4) Environment Null 13) Agriculture Null 15) Tourism Null	4) Environment Null 13) Agriculture IKAN Adapt: Strengthening the adaptive capacity, resilience and biodiversity conservation ability of fisheries and aquaculture-dependent livelihoods in Timor-Leste is one of the key climate financing programs in progress. It is joint led by the Food and Agriculture Organisation of the United Nations (FAO) and National Directorate of Fisheries and Aquaculture under the Ministry (GEF) 15) Tourism Null
Ministry of Transport and Communications Education Null	All <u>National Climate Change Policy</u> recognises that the Ministry of Transport and Communications has a critical role to play in policy		

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
 Health Null  Social Inclusion Null  Environment  Culture and heritage Null  Roads and bridges  Water and sanitation Null  Electricity Null  Sea ports  Airports  Telecommunications Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector Null	implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Ministry is to be included in the interagency working group and technical working groups, which are the second tier of the institutional arrangements for the NAP process (SSE, 2021) 4) Environment - One division under the Ministry has a climate-related mandate to develop, manage and operate meteorological, climatology and seismology surveillance systems (UNDP and MOF, 2022) 6) Roads and bridges - Two divisions under the Ministry have climate-related mandates including providing strategic and political guidance for developing climate resilient transport and communications infrastructure (UNDP and MOF, 2022) 9) Sea ports - Two divisions under the Ministry have climate-related mandates including providing strategic and political guidance for developing climate resilient maritime infrastructure as well as implementing, operating and maintaining infrastructure (UNDP and MOF, 2022) 10) Airports Null 11) Telecommunications - One division under the Ministry has the climate-related mandate to provide strategic and political guidance for developing	4) Environment Null 6) Roads and bridges This Ministry has a mandate to develop the legal framework and regulate the activities of the climate resilient land transport sector (UNDP and MOF, 2022) 9) Sea ports Null 10) Airports Null 11) Telecommunications Null	4) Environment - CF-TL has funded the implementation of their mandate to develop meteorological, climatology and seismology surveillance systems (UNDP and MOF, 2022) 6) Roads and bridges - Infrastructure Fund has supported transport sector resilience. Funded projects must meet requirements in a climate and disaster survey as part of the Feasibility Study Guideline (DRTL, 2022) 9) Sea ports Null 10) Airports - Expansion of Presidente Nicolau Lobato International Airport will be financed by development partners, namely Asian Development Bank and Japan International Cooperation Agency, a portion of which will be used for climate change adaptation (UNDP and MOF, 2022) 11) Telecommunications Null

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
	climate resilient telecommunications infrastructure (UNDP and MOF, 2022)		
    Ministry of Public Works Education Null Health Null Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Water and sanitation Electricity Sea ports Null Airports Null Telecommunications Null Rural development Agriculture Null Petroleum Null Tourism Null Private sector Null	All <u>National Climate Change Policy</u> recognises that the Ministry of Public Works has a critical role to play in policy implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Ministry is to be included in the interagency working group and technical working groups, which are the second tier of the institutional arrangements for the NAP process (SSE, 2021) 6) Roads and bridges - One division under the Ministry has climate-related mandates to maintain and conserve the conditions of roads and bridges and recover it as part of emergency response, rehabilitate rural roads, plan and design of roads, bridges and flood control, and ensure work quality control (UNDP and MOF, 2022) 7) Water and sanitation - Four divisions under the Ministry have climate-related mandates, the key ones being updating current planning, developing, operating, and maintaining practices, protecting water sources by collecting and analysing hydrological data to respond to the impacts of climate change and ensuring climate-sensitive coordination and management of water and sanitation services (UNDP and MOF, 2022) 8) Electricity - Three divisions under the Ministry have climate-related mandates, the key ones being increasing the supply of renewable energy and preparing renewable energy related electricity	6) Roads and bridges - The Ministry has a mandate to develop and implement relevant legal frameworks (UNDP and MOF, 2022) 7) Water and sanitation - The Ministry has a mandate to integrate climate considerations into the legal framework for water supply and sanitation and the strategy around for its implementation (UNDP and MOF, 2022) 8) Electricity - The Ministry has a mandate to prepare technical regulations for promoting renewable energy (UNDP and MOF, 2022)	6) Roads and bridges Null 7) Water and sanitation - The Ministry has a mandate to invest in, operate and maintain water supply systems in rural and urban areas (UNDP and MOF, 2022) 8) Electricity - CF-TL has funded the development of renewable energy production plants, installation and maintenance of photovoltaic systems (UNDP and MOF, 2022)

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
	plan and technical studies (UNDP and MOF, 2022) 12) Rural development General Directorate of Administration and Finance under the Ministry is responsible for coordinating and managing cooperative services in adapting the rural community to the impacts of climate change (UNDP and MOF, 2022)	12) Rural development Null	12) Rural development Infrastructure Fund has funded LiDAR survey and spatial mapping activities that are highly climate relevant for rural development (DRTL, 2022)
Ministry of Petroleum and Minerals Education Null Health Null Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Tourism Null Private sector Null	14) Petroleum <u>National Climate Change Policy</u> recognises that the Ministry of Petroleum and Minerals has a critical role to play in policy implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Ministry is to be included in the interagency working group and technical working groups, which are the second tier of the institutional arrangements for the NAP process (SSE, 2021)	14) Petroleum One division under the Ministry has the climate-related mandate to develop legislative proposals for exploration of natural resources (minerals) (UNDP and MOF, 2022)	14) Petroleum Null
Ministry of Tourism, Trade and Industry Education Null Health Null Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Null	All <u>National Climate Change Policy</u> recognises that the Ministry of Tourism, Trade and Industry has a critical role to play in policy implementation (DRTL, 2022) <u>National Adaptation Plan</u> states that the Ministry is to be included in the interagency working group and technical working groups, which are the second tier of the institutional arrangements		



Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Private sector	for the NAP process (SSE, 2021) 15) Tourism - Three divisions under the Ministry have climate-related mandates including developing climate responsive tourism policies and strategies, supporting the private sector to provide environmentally sustainable tourism products and services, developing green tourism infrastructure, establishing green Integrated Tourism Development Zones, and campaigning for sustainable tourism practices (UNDP and MOF, 2022) - National Adaptation Plan states the Ministry will lead two priority programmes for the tourism sector. The first is on supporting the country's climate-resilient tourism resources. The second is on strengthening the market for climate-resilient nature-based tourism (SSE, 2021) 16) Private sector - Three divisions under the Ministry have climate-related mandates including establishing green industrial centres, providing technical support and training for green manufacturing industry, and offering support for developing green Micro, Small and Medium Enterprises (MSMEs) (UNDP and MOF, 2022)	15) Tourism Null 16) Private sector Null	15) Tourism Null 16) Private sector Null
TradeInvest Education Null Health Null Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Null	16) Private sector Tasked with the responsibility of facilitating investment growth in key sectors, advocating government for necessary policy support, and mainstreaming climate sensitive gender concerns in the operations of private sector businesses (UNDP and MOF, 2022)	16) Private sector Null	16) Private sector Null

Entity and priority sectors	Institutional and policy arrangements	Legal arrangements	Financial arrangements
 Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector			
 Institute for Support to Business Development Education Null Health Null Social Inclusion Null Environment Null Culture and heritage Null Roads and bridges Null Water and sanitation Null Electricity Null Sea ports Null Airports Null Telecommunications Null Rural development Null Agriculture Null Petroleum Null Tourism Null Private sector	16) Private sector Tasked with the responsibility of training green entrepreneurs, conducting market research for green products and services, developing innovative ideas, providing business incubation support and offering business matchmaking services for designing green value chains (UNDP and MOF, 2022)	16) Private sector Null	16) Private sector Null

3.2 Annex B: Arup's Climate Resilient Infrastructure framework (C.R.In) for assessing Timor-Leste's performance

Enabler	Scoring – 1	Scoring – 2	Scoring – 3
Institutional architecture	Cooperation – Minimal cooperation between climate-related government ministries and with the private sector, which could be due to a lack of coordination platforms, limited buy-in from stakeholders, among other reasons. Decision-making – Decision-making is limited to a few government ministries, and climate resilience is not a priority for some key climate-related ministries. Climate resilience does not inform national, municipal and sectoral plans and budgets. Responsibilities – Unidentified or unclear responsibilities of government ministries leads to limited action.	Cooperation – Cooperation between climate-related government ministries and with the private sector, though cooperation could be more effective. Decision-making – Collective decision-making is supported by coordinating entities, though overlaps between climate resilience initiatives exist. Climate resilience sometimes informs national, municipal and sectoral plans and budgets. Responsibilities – Clearly identified responsibilities of government ministries, though action is not sustained overtime as ministries are not fully held accountable.	Cooperation – Effective cooperation between climate-related government ministries and with the private sector. Decision-making – Collective decision-making with climate resilience as a shared priority. Climate resilience systematically informs national, municipal and sectoral plans and budgets. Responsibilities – Accountability and clearly identified responsibilities of government ministries leads to sustained action.
Legal and regulatory frameworks	Legal and regulatory frameworks – Frameworks do not create a strong legal mandate to act on climate change, public and private sector are not driven to implement programmes for climate resilience. Sectoral legal and regulatory frameworks do not integrate climate resilience. Enables climate finance – Legal and regulatory environment generally needs strengthening to create a market for domestic and international private sector finance. Data used to inform technical standards, regulations, and guidelines – Technical standards, regulations and guidelines such as for infrastructure or land management are not informed by the latest available data and science and are ill-adapted to the local context.	Legal and regulatory frameworks – Environmental frameworks are explicitly linked to climate change, encouraging both public and private sector to implement programmes for climate resilience. Sectoral legal and regulatory frameworks sometimes integrate climate resilience. Enables climate finance – Good legal and regulatory environment generally, though limited integration of climate resilience means climate finance from domestic and international private sector is not mobilised to its full potential. Data used to inform technical standards, regulations, and guidelines – Technical standards, regulations and guidelines such as for infrastructure or land management are informed by the latest available data and science, though could be adapted better to the local context.	Legal and regulatory frameworks – Climate change focused frameworks exist, spurring both public and private sector to implement programmes for climate resilience. Sectoral legal and regulatory frameworks clearly and consistently integrate climate resilience. Enables climate finance – Strong legal and regulatory environment generally and that also integrates climate resilience helps to attract climate finance from domestic and international private sector. Data used to inform technical standards, regulations, and guidelines – Technical standards, regulations and guidelines such as for infrastructure or land management are informed by the latest available data and science that is adapted to the local context.

Enabler	Scoring – 1	Scoring – 2	Scoring – 3
Policy, planning and strategic environment	Policy coherence – Public policy and strategies do not consolidate policy goals for climate adaptation and resilience across Nationally Determined Contributions, national or urban vulnerability assessments and climate adaptation programmes, leading to fragmented policy goals. Cross-boundary and cross-sectoral coordination – Policies, plans and strategies do not reflect good coordination across administrative boundaries and sectoral priorities, limiting the use of ecosystem-based adaptation approaches. Climate policies inform infrastructure planning – Climate policy goals do not inform the development of national spatial development frameworks, infrastructure development plans and city masterplans.	Policy coherence – Public policy and strategies consolidate policy goals for climate adaptation and resilience across Nationally Determined Contributions, national or urban vulnerability assessments and climate adaptation programmes, though some overlapping and/or outdated climate policy goals exist. Cross-boundary and cross-sectoral coordination – Policies, plans and strategies reflect good coordination across administrative boundaries, but not across sectoral priorities or vice versa. Climate policies inform infrastructure planning – Climate policy goals sometimes inform the development of national spatial development frameworks, infrastructure development plans and city masterplans.	Policy coherence – Public policy and strategies consolidate policy goals for climate adaptation and resilience across Nationally Determined Contributions, national or urban vulnerability assessments and climate adaptation programmes. Cross-boundary and cross-sectoral coordination – Policies, plans and strategies reflect good coordination across administrative boundaries and sectoral priorities, which ecosystem-based adaptation approaches require. Climate policies inform infrastructure planning – Climate policy goals systematically inform the development of national spatial development frameworks, infrastructure development plans and city masterplans.
Technology uptake, affordability and private-sector financing	Level of ‘life cycle’ and ‘total value’ approach – Adoption of new technologies for climate resilient outcomes or development of climate resilient infrastructure focus solely on capital costs with minimal considerations for operational costs. Financial feasibility – Climate-related plans, especially plans requiring new technologies, are often not financially feasible. Limited investments support the uptake and operation of new technologies as investment risk sharing mechanisms with the private sector remain a challenge.	Level of ‘life cycle’ and ‘total value’ approach – Adoption of new technologies for climate resilient outcomes or development of climate resilient infrastructure do not focus solely on capital costs, though a ‘life cycle’ and ‘total value’ approach is only at times taken. Financial feasibility – Climate-related plans, especially plans requiring new technologies, are partially financially feasible. Investments support the uptake and operation of new technologies and investment risks are shared with the private sector, though there have been few investments to-date.	Level of ‘life cycle’ and ‘total value’ approach – Adoption of new technologies for climate resilient outcomes or development of climate resilient infrastructure do not focus solely on capital costs and instead a ‘life cycle’ and ‘total value’ approach is consistently taken. Financial feasibility – Climate-related plans, especially plans requiring new technologies, are fully financially feasible. Significant investments support the uptake and operation of new technologies and investment risks are shared with the private sector.

Enabler	Scoring – 1	Scoring – 2	Scoring – 3
Data and information	Up-to-date – Climate data and science, related assessments and scenarios, demographic and sectoral data on development needs and drivers, among other relevant data and information are mostly outdated. Accessibility – Relevant data and information is difficult to access by climate-related government ministries, limiting the evidence base for decision-making. Cross-sectoral – Level of data availability and quality across sectoral ministries tends to be inconsistent, leading to incoherent planning and budgeting at national or municipal levels between these sectors.	Up-to-date – Climate data and science, related assessments and scenarios, demographic and sectoral data on development needs and drivers, among other relevant data and information are partially up-to-date. Accessibility – Relevant data and information is easily accessed by some, but not all, climate-related government ministries. Cross-sectoral – Level of data availability and quality across some sectoral ministries is good, enabling coherent planning and budgeting at national or municipal levels between these sectors. However, some sectors are missing due to poor availability and quality of data.	Up-to-date – Climate data and science, related assessments and scenarios, demographic and sectoral data on development needs and drivers, among other relevant data and information are all up-to-date. Accessibility – Relevant data and information is easily accessed by climate-related government ministries so that it can inform decision-making. Cross-sectoral – Level of data availability and quality across sectoral ministries is consistent and interoperable, enabling coherent planning and budgeting at national or municipal levels.
Stakeholder engagement	Cross-sectoral collaboration – Minimal collaboration between stakeholders from public and private sector, academia and civil society involved in climate change and disaster risk management as well as specific sectors (e.g. water, health, transport, infrastructure, etc.) as stakeholder engagement processes do not exist. Multilevel communication – Limited communication and engagement meaning data inputs for national strategies, project prioritisation and adaptation of regulations and technical guidance does not fully represent all levels of government.	Cross-sectoral collaboration – Some collaboration between stakeholders from public and private sector, academia and civil society involved in climate change and disaster risk management as well as specific sectors (e.g. water, health, transport, infrastructure, etc.), though more open and proactive stakeholder engagement processes are needed to increase effectiveness. Multilevel communication – Good communication and engagement between some national, municipal and other local equivalent governments, though communication and engagement gaps exist in some cases.	Cross-sectoral collaboration – Effective collaboration between stakeholders from public and private sector, academia and civil society involved in climate change and disaster risk management as well as specific sectors (e.g. water, health, transport, infrastructure, etc.). This could be enabled by open and proactive stakeholder engagement processes. Multilevel communication – Strong communication and engagement between the different levels of government including national, municipal and other local equivalents supports data collection for national strategies, validating project prioritisation and ensures regulations and technical guidance are adapted to the local context.

Enabler	Scoring – 1	Scoring – 2	Scoring – 3
Human capacity and uptake capability	Skilled human capital – Limited human capital with skills for planning and implementing financially viable climate-related projects, with insufficient or poor technical capacity support leading to significant skills gaps. Institutional capacity – Government entities at all levels do not have the capacity to enforce climate-related standards and guidelines and embed climate resilience considerations into their planning and budgeting processes. Technology uptake capacity – Existing technologies to build climate resilience are not known to industry. New technologies are not supported by industry plans to develop capacities to uptake and sustain it as they do not exist.	Skilled human capital – Decent human capital with skills for planning and implementing financially viable climate-related projects, with technical capacity support from international partners, academia and professional associations, though there are skills gaps. Institutional capacity – Government entities at some levels have the capacity to enforce climate-related standards and guidelines and embed climate resilience considerations into their planning and budgeting processes, though greater consistency is needed. Technology uptake capacity – Existing technologies to build climate resilience are still new to industry. Some new technologies are supported by industry plans to develop capacities to uptake and sustain it.	Skilled human capital – Sufficient human capital with skills for planning and implementing financially viable climate-related projects. Technical skills are strengthened by technical capacity support from international partners, academia and professional associations. Institutional capacity – Government entities at all levels have the capacity to enforce climate-related standards and guidelines and embed climate resilience considerations into their planning and budgeting processes. Technology uptake capacity – Existing technologies to build climate resilience are mastered by industry. New technologies are supported by industry plans to develop capacities to uptake and sustain it.
Financial governance	Understanding of governing bodies – Financial system governance bodies are not aware of climate risks and the need to understand and govern it on investments. Level of climate risk disclosure – Tools are not available to assess and disclose climate risks, limiting long-term investment planning and restricting market confidence. Domestic and international mechanisms – Minimal availability of mechanisms to finance projects for climate resilience at both national and municipal levels. Alignment of municipal budgets – Municipal budget comprising of tax revenue, fees earned from municipal services and fiscal transfers from other levels of government are generally not aligned to national, regional and municipal climate adaptation strategies.	Understanding of governing bodies – Financial system governance bodies have some awareness of climate risks, but understanding is not good enough to fully govern it. Level of climate risk disclosure – Tools are available to assess and disclose climate risks, though are not widely used yet to support long-term investment planning and boost market confidence. Domestic and international mechanisms – Mechanisms to finance projects for climate resilience are available, though mechanisms are limited in number or to a certain level of government. Alignment of municipal budgets – Municipal budget comprising of tax revenue, fees earned from municipal services and fiscal transfers from other levels of government are sometimes aligned to national, regional and municipal climate adaptation strategies.	Understanding of governing bodies – Financial system governance bodies understand and govern climate risks on investments. Level of climate risk disclosure – Tools are available and widely used to assess and disclose climate risks, enabling long-term investment planning and stimulating market confidence. Domestic and international mechanisms – Mechanisms to finance projects for climate resilience are available at both national and municipal levels. This could include innovative climate finance instruments such as climate bonds, national budgets where the private sector can borrow from, and financial support from national and international financial institutions. Alignment of municipal budgets – Municipal budget comprising of tax revenue, fees earned from municipal services and fiscal transfers from other levels of government are systematically aligned to national, regional and municipal climate adaptation strategies.

A.3 Appendix C | Work Package 3

Assessment of Climate Vulnerability – Timor Leste

Work Package 3 – Technical and Financial Support (Draft)

12/05/2023



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Executive Summary

Assessing climate resilient financing / funding opportunities

This work package outlines the opportunities for FCDO to provide Timor-Leste with either financing or technical assistance that would enable increased access to finance to support climate resilience initiatives. Climate financing or funding, for the purpose of this report, has been defined as the flow of funds to all activities, programmes or projects aimed at social capital, infrastructure development, and economic development associated with climate change. Using the same definition as the *UNDP Climate Public Expenditure and Institutional Review 2022*, to determine if an expenditure of project was climate change relevant, the following question was asked: *Would this expenditure help Timor-Leste adapt to or mitigate the impacts of climate change?*

As such, focus areas and projects encompassed under this report’s definition of climate financing include:

- Climate Mitigation Projects
- Climate Adaptation Projects
- Financial market flows and activity including bank loans, green financing, sustainable financing and low carbon financing for the purposes of addressing climate change effects
- Projects where links to climate change were extensively discussed in project documentation

Given there is limited distinction in project definition between whether funding or financing is being directed towards mitigation or adaption, this document looks at both in combination.

This report looks at three main sources of financing / funding towards climate resilience and associated projects, these are:

- Multilateral finance / funding
- Private finance
- Public funding

To identify the opportunities, a three-part assessment was undertaken, made up of:

- 1. State of play:** Global and Southeast Asian key trends in climate resilience financing, including challenges. This outlines the flow of financing in multilateral, public and private sector financing. Multilateral and private financing details focuses on the Southeast Asian context and the current funding and financing challenges apparent in the region. Public financing and its role in Timor-Leste is assessed in further detail given increasing reliance on public expenditures.
- 2. Stakeholder engagement:** Outcomes from stakeholder engagement and key findings.
- 3. Priority sector financing in Timor-Leste:** Key projects, investments and trends per sector. This provides an assessment of FCDO potential in the sector using a multi-criteria assessment. For the projects in each key sector, their relevance to climate change adaptation and resilience has been clearly articulated, as well as the value of the project and any key terms.

It is key to note that a number of projects outlined in this document are from the *UNDP Climate Public Expenditure and Institutional Review 2022*, and therefore applies its definition of climate financing. Overall, most projects in this document have a strong alignment to climate financing, however, finding clear links was a limitation of this assessment. As such, although the definition of climate financing was broad, the desktop review identifying that it continues to makes up small portion of overall private, multilateral and public funding.

Timor-Leste’s *Strategic Development Plan 2011-2030* identifies priority sectors, further explored in this section. These are listed on the right. In addition to this governance has also been assessed as it supports the overall delivery of other sectors.

-  Education
-  Health
-  Agriculture
-  Private sector
-  Social inclusion and gender equity
-  Environment
-  Roads and bridges
-  Water and sanitation
-  Electricity
-  Sea and airports
-  Telecommunications
-  Rural development
-  Petroleum
-  Tourism
-  Cultural heritage

Executive Summary

State of Play

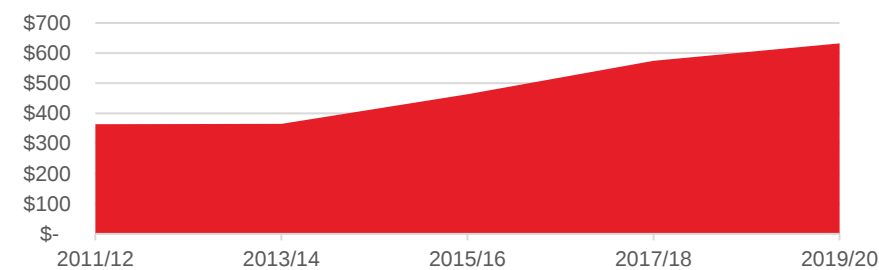
The State of Play looked at MDB, private and public finance from a global and Southeast Asia level. Then the public financing was explored in further detail for Timor-Leste. There were a number of key findings from this, including:

- Despite an increase in MDB climate funding and financing over the past decade, additional funding is needed to meet internationally agreed climate standards. This is also the case for Timor-Leste.
- Private finance has the potential to play a crucial role in meeting the goals of the Paris Agreement, however its potential remains untapped.
- Often public institutions play a major role in driving climate actions globally, and within Timor-Leste, this focus is continuing to increase.
- Governments globally, particularly China, are continuing to act as financiers and intermediaries for supporting climate change in countries such as Timor-Leste.

Further details of the findings of the State of Play are highlighted on the right.

Climate funding and financing is steadily increasing

Total climate finance globally has steadily increased over the last decade, reaching USD \$632 billion in 2019/2020 (see below). Despite this, an increase of at least 590% in annual climate finance is required to meet internationally agreed climate objectives by 2030.



Global climate finance flows between 2011– 2020 (USD, Billions)

MDB Climate funding and funding in SEA is experiencing a number of challenges

- Key MDBs and their level of climate financing in 2021 in Southeast Asia include: World Bank – USD \$519 Million, Asian Infrastructure Investment Bank – USD \$90 Million and the Asian Development Bank (ADB) – USD \$7 Million.
- In Southeast Asia, MDBs are focusing their climate financing within the transport and energy sectors (comprising 57% of mitigation funding).
- Competition from other sources of funding are a key challenge for MDBs, including China's Belt and Road Initiative.
- Reduced donor support creates funding and resource constraints limiting the ability to support the region.
- Existing high levels of debt and weak credit profiles hinder access to capital.

Private financing can act as a strong player

- Private investors have an opportunity to capitalise on green financing opportunities in the Southeast Asian region, including corporate funding, private equity and venture capital, sovereign wealth funds, green funds and infra funds.
- Most private green finance required is for mitigation (\$US293B), with the remainder adaptation (\$US129B).
- Focus is typically in renewables and the built environment, making up 90% of corporate investment.
- The private sector can act as a strong source of financing, particularly where green bonds issued by Government can generate strong risk-return profiles. However, Timor-Leste needs to continue to develop projects with reasonable returns, and lower upfront costs in order to fully capture the potential of private financing.

Public funding in Timor-Leste has declined

- Climate public expenditure, including the Consolidated Fund of Timor-Leste (CFTL), Infrastructure Fund, and development partners has declined between 2018-2021.
- Infrastructure (roads and bridges) received the most funding (US \$104 million), followed by agriculture (US \$26 million), health (US \$20 million), and urban and rural development (US \$14 million).
- Petroleum trade and the associated Government revenue can be impacted from the move towards net zero emissions. However, this net zero transition can reduce the risk of a fiscal cliff once reserves are depleted.
- Climate change may not be seen as a priority issue by Government, particularly given the strength of the petroleum sector, with economic growth and development are often seen as higher priorities.
- Public financing institutions can improve access to climate finance by increasing their transparency and outreach of financing options and opportunities.

Executive Summary

There is potential opportunity for FCDO investment across most sectors, based on an assessment of whether: a) FCDO can add value in the sector, b) a significant funding gap exists in the sector, and c) support is required in the sector to improve Government capability in deal structuring.

Priority sector climate funding and financing in Timor-Leste

The review of a number of sources, including the UNDP CPIER report, highlighted a number of projects in climate financing or funding. It is key to note that despite the broad definition of climate financing adopted for this report, there is still limited funding targeted at either mitigation or adaptation.

Below are the key sectors that were shown to have the greatest potential in Timor-Leste based on the funding and financing factors.

- **Education:** Compared to more revenue generating investments, education has relatively low funding levels. Funded projects are rarely linked to climate change adaptation and resilience outcomes.
- **Environment:** Environment is a sector with strong Government policy, however insufficient funding, due to potential lack of perceived private sector and general public awareness and/or lack of clear revenue sources. FCDO could improve this awareness or support access to various MDBs.
- **Social inclusion and gender equity:** Given the importance of the sector and interrelationship with other sectors, FCDO can support and assist in developing improved mitigation measures, moving away from reactive grant funding structures.
- **Water and sanitation:** FCDO can play a role in providing technical assistance to help discover and create awareness of the strong links the sector has to climate resilience. It can also top Government funded initiatives to support projects that are short on funding.
- **Others:** Rural development, tourism, cultural heritage, and private sector.

Timor-Leste priority sector	FCDO can value add in the sector	Requires additional funding	Support required to improve access to funding/financing
Education	Explore further	Explore further	Possible
Electricity	Possible	Possible	Explore further
Environment	Explore further	Explore further	Possible
Social inclusion and gender equity	Explore further	Explore further	Possible
Water and sanitation	Explore further	Possible	Explore further
Rural development	Explore further	Explore further	Possible
Tourism	Explore further	Explore further	Possible
Private sector	Explore further	Explore further	Possible
Cultural heritage	Possible	Explore further	Explore further
Sea and airports	Possible	Low priority	Explore further
Health	Explore further	Possible	Possible
Petroleum	Explore further	Possible	Possible
Agriculture	Possible	Possible	Explore further
Telecommunications	Possible	Low priority	Possible
Roads and bridges	Possible	Low priority	Low priority

LEGEND

■ Low priority
 ■ Possible
 ■ Explore further

State of Play

Introduction

Climate resilience is typically delivered through three main sources of funding or finance, as outlined below. The existing capability and focus of each impacts FCDO’s investment capability and potential success in Timor-Leste.

What are the different types of financing / funding?

Multilateral Finance	Private Finance	Public Funding
• Grants, funding or financing that is provided by Multilateral Development Banks (MDBs) to fund various infrastructure projects across various sectors in developing countries. • Typically, with low cost of financing as they are meant to improve the economic conditions of impoverished or developing nations, and these funding or financing prioritises development goals. • Technical assistance is not just financing, but support that facilitates the preparation and the execution of infrastructure projects or capital investment programs.	• Financing that is raised or extended by the private sector to finance major public works and infrastructure projects, and generate returns either via payments from Governments or revenues generated from the infrastructure project • Private finance reduces the burden on Governments to utilise public resources for upfront financing of infrastructure project development. • This can be from a number of sources, including Green Bonds, Climate Financing or Impact Investing, which are funds with specific climate, environmental or other performance targets.	• Government funding through public expenditure towards climate related programs or projects. • For Timor-Leste relevant funds include the Consolidates Fund of Timor-Leste and the Infrastructure fund.

Example providers

• Asian Development Bank (ADB) • World Bank (WB) • USAID • Department of Foreign Affairs and Trade (Australia) • Korea International Cooperation Agency (KOICA)	• Commercial banks • Investment companies • Pension funds • Insurance companies • Sovereign wealth funds	• Public expenditure • Grants • Government funds
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State of Play

The ‘State of Play’ acts as a global and regional context provider, highlighting key impacts and linkages to Timor-Leste

Introduction

To understand the context and drivers of climate financing or funding in Timor-Leste, the global and region specific trends, drivers and challenges have been presented. Given that climate funding and financing from a number of sources is still not mature in Timor-Leste, it is important to demonstrate the trends, risks and challenges experienced by each funding source. It is expected that these will be, or are currently been experienced in Timor-Leste once all investment types are matured.

In addition to this, the literature review was limited in terms of information from a public and private sector perspective, and as such, our analysis was focused from a global and regional perspective for this reason.

The global overview helps shape the narrative of shared drivers of funding and financing. This is because many of the challenges experienced directly in Timor-Leste, are also experienced and sometimes influenced by the global issues and trends.

Multilateral and private finance have been discussed on a Southeast Asian level, given the flows are interrelated, with the direct impact on Timor-Leste outlined.

When discussing public funding it was not seen as relevant to discuss on a global or regional level, as such only discussed in the context of Timor-Leste.

The structure and flows of the State of Play is outlined in the following figure, with the flows of ‘so what’ for Timor-Leste included.

	Multilateral Finance	Private Finance	Public Funding
Global overview			
Southeast Asia*			
Timor-Leste			

State of Play structure

* Although often thought of as a part of the Pacific or Southeast Asia, it has been defined as a part of Southeast Asia for the purpose of this report.

State of Play

Despite an increase in climate financing over the past decade, additional funding is needed to meet internationally agreed climate standards.

Global overview of climate financing or funding

Global Climate Change Targets

Globally, climate change targets have been set, with the most notable being the Paris Agreement, an international treaty signed in 2015 to limit global warming below 2°C above pre-industrial levels, while pursuing efforts to limit the increase to 1.5°C. Figure 1.1 shows how total climate finance globally has steadily increased over the last decade, reaching USD \$632 billion in 2019/2020. Despite this, an increase of at least 590% in annual climate finance is required to meet internationally agreed climate objectives by 2030.¹

Below is a summary of multilateral, private and public finance support towards these targets and supporting climate resilience, discussed further later in this section.

Multilateral Finance

Over the past decade, multilateral finance has channelled growing volumes of Official Development Assistance (ODA) to developing countries.* The total volume channelled through the multilateral development system is significant, amounting to USD \$78.6 billion in 2020, or 41% of total ODA.² Additionally, financial inflows into multilateral finance have been rising, between 2012 and 2019, contributions to multilateral development organisations increased from USD \$56.8 billion to USD \$70.6 billion (up 24%).²

Climate finance committed by major Multilateral Development Banks (MDBs) reached over USD \$19 billion to climate change adaptation projects in 2021, a 24% increase from 2020.³ Despite the rising climate financing, further funding is required to close the growing gap. According to recent estimates, the volume of climate finance flows needs to increase by three to six times by 2030 to limit global warming to below 2°C.⁴

Impact on Timor-Leste: Despite the growth in climate finance interest globally, there is a continued effort required to channel that funding to Timor-Leste in order to limit causes and impacts of climate change.

Private Finance

According to the Climate Policy Initiative, private investment in clean energy reached a record high of USD \$333 billion in 2020, with the majority of investment supporting renewable energy and energy efficiency projects.⁵

However, the United Nations Environment Programme (UNEP) estimated that an additional USD \$5-7 trillion per year is needed to meet the goals of the Paris Agreement by 2050.⁶ Private climate financing needs to play a pivotal role as emerging markets and developing economies look to reduce greenhouse gas emissions and contain climate change while coping with its effects.

In 2021, a record USD \$250 billion was expended in 2021, however there remains a funding gap as private finance must at least double by 2030 to meet net zero requirements.⁷

Impact on Timor-Leste: Private financing has the potential to play a crucial role in Timor-Leste, however, additional funding is required.

Public Funding

Public institutions and Governments play a major role in driving climate actions globally, and within Timor-Leste. Public finance actors and intermediaries committed to more than the half (51%) of climate financing, coming to USD \$321 billion in 2019/2020, this is a 7% increase from 2017/2018, highlighting the reignition of the importance of improving climate resilience outcomes globally.⁸

Figure 1.2 shows the strong global direction of public (inclusive of funding distributed by multilateral institutions) and private financing towards with East Asia and the Pacific, accounting for 47% global of total public and private financing. Although seen as bi-lateral finance, One of the primary reasons for higher private and public funding and finance directed towards East Asian and Pacific region was partially due to an increase in climate financing from China. This is attributed to its strong public spending on climate projects and conducive national policies for domestic investment.

Impact on Timor-Leste: Globally Governments, particularly China are continuing to act as financiers and intermediaries for supporting climate change in countries such as Timor-Leste.

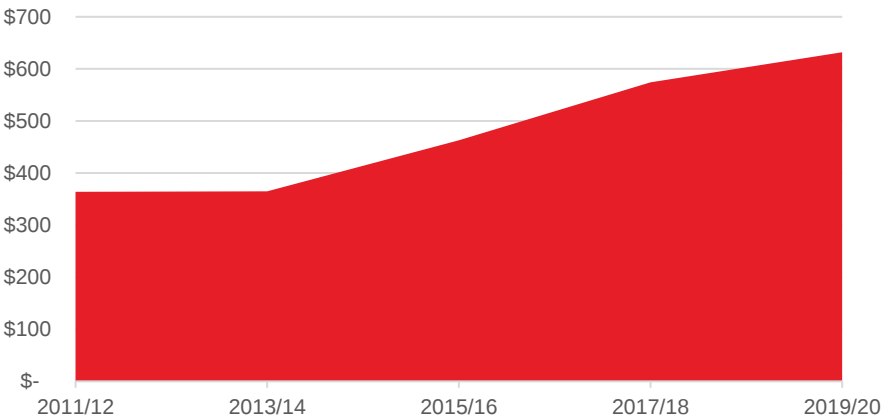


Figure 1.1: Global climate finance flows between 2011– 2020 (USD, Billions)⁵

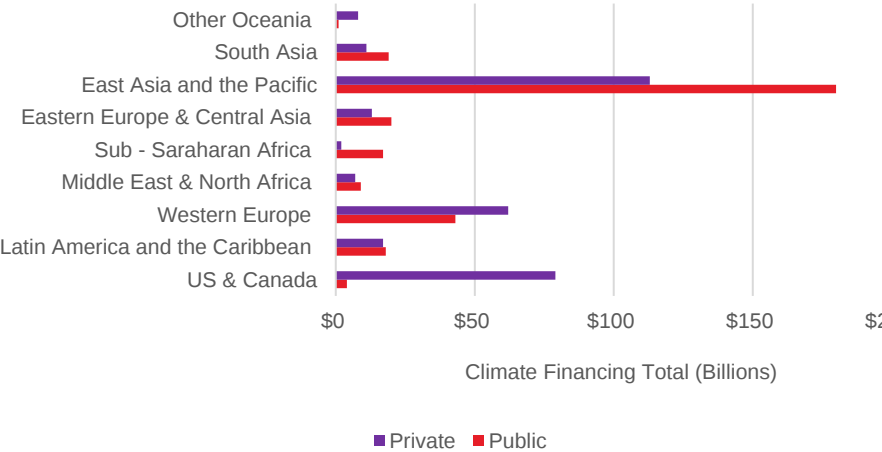


Figure 1.2: Destination region of climate finance, by public/private (USD billion, 2019/2020 annual average)⁵

*This amount is made up of: (i) contributions to the budgets of multilateral organisations (known as “core” or “multilateral ODA”), representing 26% of total ODA; and (ii) non-core contributions earmarked through multilateral organisations (so-called “multi-bi aid”). Note this does not include commercial debt products or other financing tools.

State of Play

In Southeast Asia, MDBs are focusing their climate financing within the transport and energy sectors, with competition from other sources of funding, and reduced donor support continuing to challenge success.

Multilateral financing

Multilateral Financing in Southeast Asia

Southeast Asia is particularly vulnerable to climate change due to higher emissions, carbon footprint and susceptibility to natural disasters. The region faces increasing energy demands and supports global climate commitments and funds including the Paris Agreement, Green Climate Fund and the ASEAN Catalytic Green Finance Facility. The ADB alone has also increased its climate funding ambition, allocating \$100 billion to climate financing to developing member countries between 2019–2030, highlighting the increased focus on climate relevant projects in the Asian Pacific region.⁹

Global climate financing is expected to increase - the UNSG’s climate financing targets expects MDB financing efforts to total at least USD \$65 billion annually by 2025, with USD \$50 billion for low- and middle-income economies, 50% above 2019 levels.¹⁰

Key MDBs and their level of climate financing in 2021 in Southeast Asia include:

- World Bank – USD \$519 Million⁵
- Asian Infrastructure Investment Bank – USD \$90 Million ⁵
- Asian Development Bank (ADB) – USD \$7 Million ⁵

Figures 1.3 and 1.4 detail the key sectors and investment focus from direct lending and funding types in the region. In 2021, most funding was targeted towards **transport and energy**, comprising 57% of mitigation funding. Energy, transport and the built environment was also the leading area of focus in adaptation financing making up 22% of total funding.

Impact on Timor-Leste: Timor-Leste continues to generate support from multilateral funding sources, with the Green Climate Fund alone financing \$53.3m of projects. Timor-Leste would benefit from the transport and energy focus, with opportunities to decrease its petroleum reliance through MDB funding.

Current Challenges

The following challenges faced by MDBs impact their ability to fund projects across Southeast Asia, and in turn Timor-Leste. These include:

- **Competition from other sources of funding:** MDBs face increasing competition from other sources of funding, including China's Belt and Road Initiative. According to the World Bank, in 2019, China provided USD \$75.2 billion in development financing to Southeast Asian countries, compared to USD \$27.1 billion provided by the World Bank.
- **Limited resources:** Funding and resource constraints, limiting ability to fully support the development needs of the region. The International Development Association (IDA) under the World Bank group has projected a USD \$22-23 billion reduction in funding across FY22 and FY23 from reduced donor resources.
- **Debt sustainability:** High levels of debt in the region, limit some countries' access to financing, and their ability to service existing loans. Asia Pacific's and Southeast Asia's least developed countries had USD \$4.1 billion in debt servicing requirements to multilateral lenders in 2020-2021, highlighting the region's growing need to improve both debt sustainability and diversity.⁵
- **Weakness in credit profiles:** Some countries in Southeast Asia have weak credit profiles. A lack of a formal credit history in countries such as Timor-Leste, the Philippines and Vietnam combined with cumbersome borrowing requirements hinder their ability to access capital, limiting for growth. ¹⁵

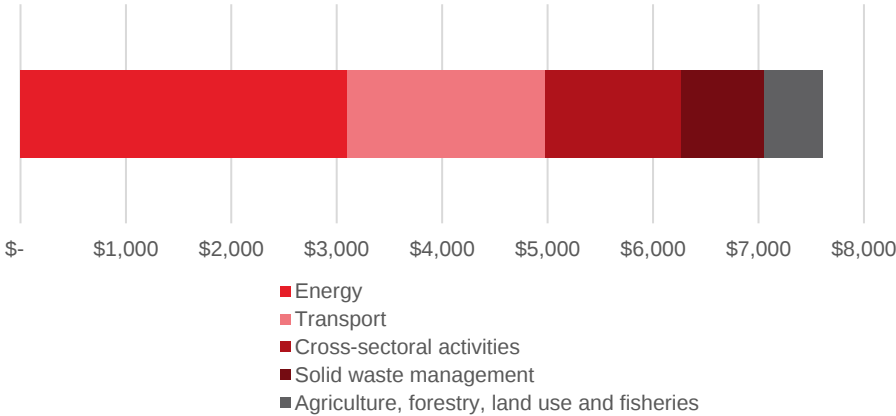


Fig 1.3: Total MDB Mitigation Financing in South Asia, East Asia and the Pacific by Activity (USD Millions, 2021) ⁵

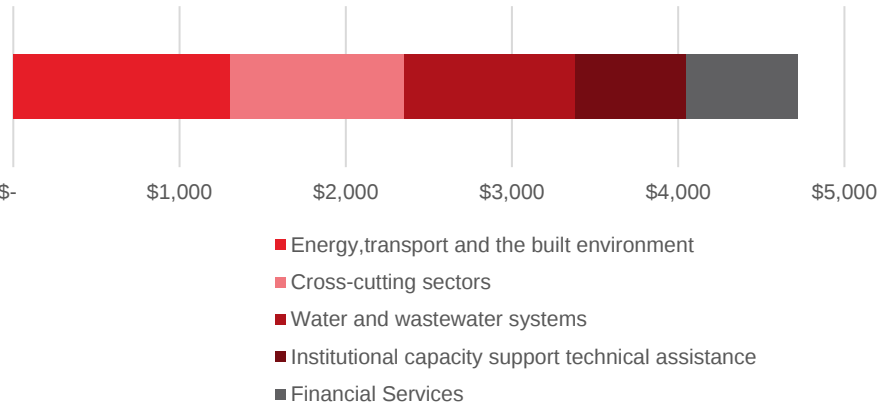


Fig 1.4: Total MDB Mitigation Financing by Activity (USD Millions, 2021) ⁵

State of Play

Although private investors have an opportunity to capitalise on green financing opportunities in the Southeast Asian region, particularly in renewables and the built environment, there remain barriers to the creation of viable opportunities.

Private financing

Private Financing in Southeast Asia

Private financing can deliver socioeconomic benefits to developing countries in Southeast Asia such as increased economic activity and job creation as well as enhanced competitiveness from new technologies and innovation.

Climate finance required for the ASEAN region is estimated to be USD \$422 billion to 2030 for most sectors.¹¹ There is a significant green financing gap with an approximate cumulative investment of USD \$3 trillion required in SEA to be on track to hit the target of 1.5°C by 2030.¹² Private financiers may be limited in servicing this funding gap due to higher upfront costs, limited understanding of return potential and how these would be realised. Figure 1.5 details corporate investment in green capital across various sectors, with ~90% in **renewables and the built environment**.

Most private green finance required is for mitigation (\$US293B), with the remainder going to adaptation (\$US129B).¹¹ For private investors this is a substantial opportunity to capitalize on an estimated \$US \$1 trillion of annual green economic opportunities in the region, focused on energy transition.¹¹

Figure 1.6 details the acceleration of green capital deployed in Southeast Asia from the various private financing types including corporate funding, private equity and venture capital, sovereign wealth funds, green funds and infra funds. Leading corporations are contributing to the region’s decarbonisation efforts, with corporate investment picking up momentum across 2021 and early 2022.

In addition to this, a number of Publicly issued green bonds have over-subscribed in the region. For example, BNI green bonds issued by the State-owned PT Bank Negara Indonesia were oversubscribed by four times in 2022. However, this trend has not been seen in private sector issued bonds.¹⁸

Impact on Timor-Leste: The private sector can act as a strong source of financing, particularly where green bonds issued by Government can generate strong risk-return profiles. However, Timor-Leste needs to continue to develop projects with high returns, and lower upfront costs in order to fully capture the potential of private financing.

Current Challenges

The following challenges faced by the private sector impact their ability to finance projects across Southeast Asia, and in turn Timor-Leste. These include:

- **Green investment pipeline:** The pipeline for commercially viable green investment opportunities remains constrained. For example, only 45% of current renewable projects in Southeast Asia are estimated to be funded viably through private financing alone (without support from outside the private sector) and 60% of infrastructure projects in emerging markets in Asia are not financially profitable without non-commercial financing that often comes from public sources.¹³
- **Maturity Mismatch:** Structural features of the ASEAN financial system create maturity mismatches, due to the dominance of relatively private institutions with a relatively short-term return period.¹⁰ There are insufficient sources of investment with the capacity to substitute green private financing for bank lending.

Many ASEAN green investment opportunities, such as infrastructure and agriculture, are characterized by relatively large medium- to long-term CAPEX requirements, with asset lives of 10 to 25 years.¹² This provides challenges in investment and funding for long term adaption and mitigation infrastructure as the tenor of banking liabilities across the global financial system is generally short-term, with weighted average maturities of commercial loans often under three years.¹²

Commercial viability: Green finance instruments, issued by the private sector including green bonds struggle to attain attractive risk-return profiles. A lot of private financiers in the region have not completed or implanted their ESG strategies or identified sufficient investments that green bonds can be used for. This is because private financiers can be wary of investing in green infrastructure projects, with higher up-front costs than conventional alternatives.

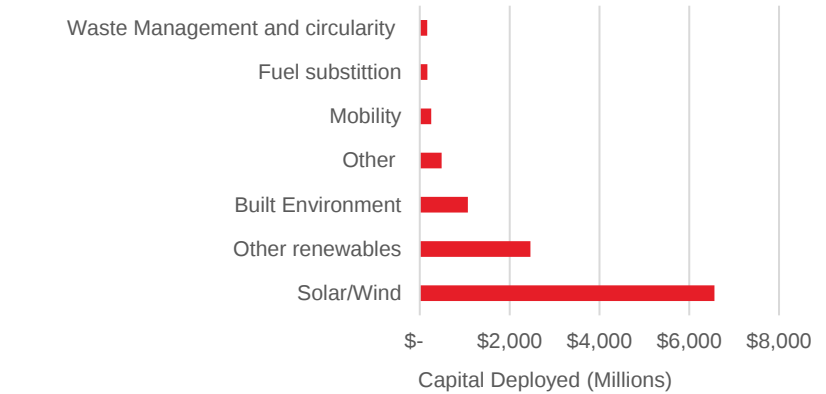


Figure 1.5: Green Capital Deployed by Investor Type (USD Millions, Type Q1 2021- Q1 2022)⁹

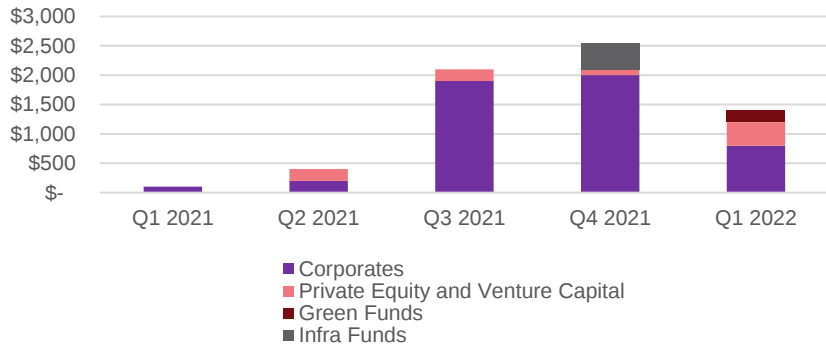


Figure 1.6: Corporate Green Capital Deployed by Sector in SEA (USD Millions, 2020-2022)⁹

State of Play

Public funding can enhance employment opportunities and improve socioeconomic outcomes in Timor-Leste, however the region has experienced a decline in public funding in recent years.

Public funding

Public Funding in Timor-Leste

Public climate resilience financing can support Timor-Leste create capacity to reverse effects of climate change and the resulting impacts, including floods, drought, and extreme weather.

Climate public expenditure, including the Consolidated Fund of Timor-Leste (CFTL), Infrastructure for the years between 2018-2021 has declined. This has particularly impacted resilience, mitigation and adaption.¹⁴ Public expenditure on climate targeted programs, projects and initiatives in 2018 accounted for 4.5% of total GDP, reducing to 2.31% of GDP in 2020.¹⁴ In this same time period, the Timor-Leste Infrastructure Fund spend reduced from USD \$48 million to US \$21 million on climate relevant projects.¹⁴

Public climate financing in Timor-Leste is distributed to a variety of sectors including infrastructure, health, agriculture, energy, education and tourism. Figure 1.7 shows the proportion of public expenditure across the primary sectors in Timor-Leste within the last 4 years. **Infrastructure (roads and bridges)** received the most funding (US \$104 million), followed by agriculture (US \$26 million), health (US \$20 million), and urban and rural development (US \$14 million).¹⁴

Public financing can stimulate economic growth by investing in renewable energy, energy efficiency, and green infrastructure projects, leading to job creation and income generation. It can also improve access to energy and reduce poverty, improve public health, and food security.

Petroleum trade and the associated Government revenue can be impacted from the move towards net zero emissions. HBS SEA analytics found the petroleum sector accounts for approximately 70% of Timor Leste’s GDP, more than 90% of the total exports, as well as more than 80% of the state’s annual revenue. With the remainder of viable reserves diminishing, the net zero transition can help find sustainable alternative fuel and energy sources, helping reduce the risk of a fiscal cliff once reserves are depleted.

The following challenges have impact ability of Timor-Leste to invest in climate funding. These include:

- **Lack of political will:** Climate change may not be seen as a priority issue, particularly given the strength of the petroleum sector by some Governments in the region, leading to limited funding for climate change mitigation and adaptation efforts.
- **Diversified funding priorities:** Economic growth and development are often seen as higher priorities for Governments in the region, which can result in limited funding for climate change initiatives. In the past few years, public funds were also directed towards COVID-19 recovery, constraining the climate change initiatives being financed in the Southeast Asian region. The Ministry of Finance’s financial records note that the Ministry of Interior in Timor-Leste only received \$1.9 million and \$1 million for natural disaster financing in 2020 and 2021 respectively, however a total of \$333.2 million, a little more than 23 percent of the total annual budget (excluding loans) was directed towards the COVID-19 fund in 2020.
- **Limited access to climate finance:** Timor-Leste faces challenges in accessing climate finance due to a lack of experience, technical capacity, and information on available financing options. Public financing institutions can improve access to climate finance by increasing their transparency and outreach of financing options and opportunities.

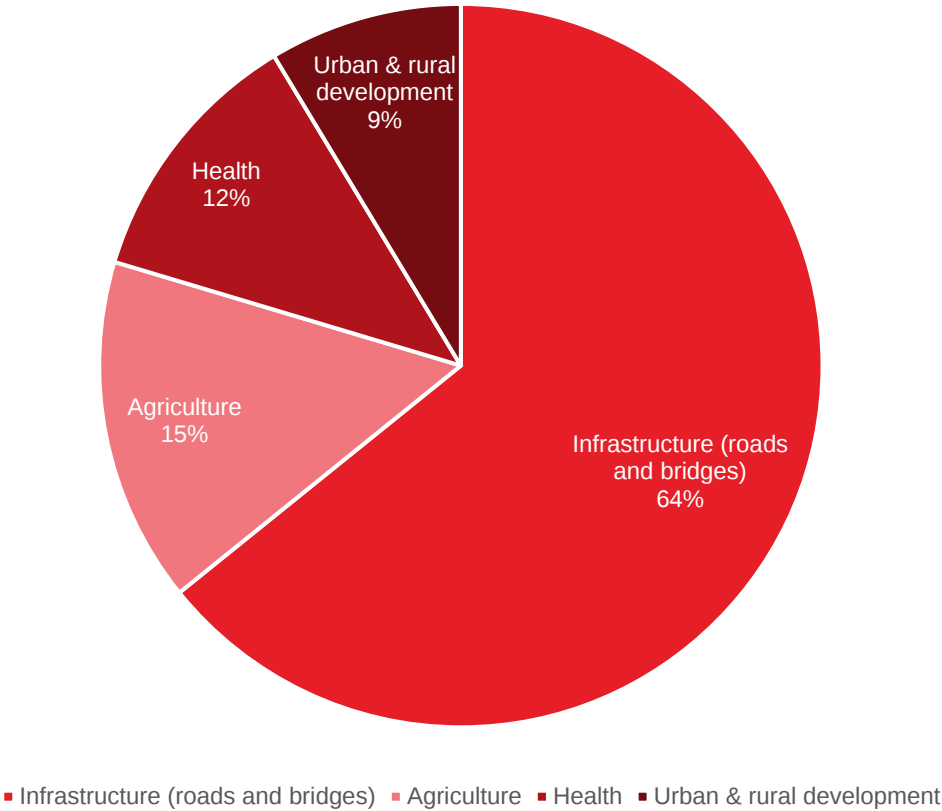


Figure 1.7: Timor Leste: Climate Public Expenditure by sector ¹²

Priority Sector climate funding and financing in Timor-Leste

Priority Sector Financing in Timor-Leste

Approach

This section outlines an overview of investment per sector from the perspective of multilateral, public and private sector sources. The purpose is to outline the potential opportunity for FCDO investment based on a financing gap assessment, desktop research and stakeholder engagement undertaken. The qualitative assessment was based on a desktop assessment of available public documents and data sources which outlined key projects, loan terms and alignment with climate funding and financing.

The assessment of sector's suitability for FCDO investment has been based on three key criteria. Based on the desktop review, these factors were seen as the differentiating factor between each sector. The criteria and justification for inclusion is outlined below:

1. FCDO can value add in the sector – to highlight whether there is a need for additional support / technical assistance in the sector, or the private or public sector can solve for climate resilience and adaption themselves.
2. Requires additional funding – to highlight if it is a high or low funded sector compared to others.
3. Support required to improve access to funding/financing – given many climate projects are driven by Government due to complexity or lower returns, highlights whether support is required to access to markets or financing.

The following tables outline the definition for each of the criteria used to assess the options, as well as the rating tool applied.

Limitations

- In our review we identified 293 projects either linked or directly supporting climate resilience initiatives. Using the OECD data to show the level of climate related investment compared to all of sector investment, there was some misalignment between the priority sectors definitions as per this document. Where this has occurred, this has been highlighted in the following pages.
- There was limited distinction in project definitions on funding and financing directed towards mitigation or adaption, as such they have been looked at in combination.
- Examples of priority sector financing were identified from the following literature and databases. There are likely to be more data and projects available for each sector.
 - UNDP Climate Public Expenditure and Institutional Review (CPEIR) 2022
 - World Bank Data Bank
 - Asian Development Bank Projects and Tenders Database
 - OECD iLibrary
 - IJGlobal database
 - Desktop research
- Evaluation against these criteria is based on desktop review only, and has been qualified in the rational and key findings. Further research to assess the potential for FCDO to engage in each sector is recommended.

Criteria	Definition
FCDO can value add in the sector	- The extent FCDO has an opportunity to add value in the sector through non-financial / monetary means. - Requirement for technical assistance. - Includes regulatory frameworks required to support the Government drive climate resilient projects, and/or building capability in the sector. - The need for FCDO to create private sector or public awareness.
Requires additional funding	Whether there is already sufficient public, private or multilateral financing in the sector based on the relative funding to other sectors.
Support required to improve access to funding / financing	The extent that FCDO could support with financial or funding interventions, such as providing financing to Government or help Government broker deals or tap into private sector investment.

Rating	Definition
Low priority	- Low priority for FCDO focus - Low likelihood of success - Low urgency - High complexity to resolve.
Possible	- Medium priority for FCDO focus - Low – medium likelihood of success - Some urgency - Medium complexity to resolve.
Explore further	- High priority for FCDO focus - Medium – High likelihood of success - High urgency - Low complexity to resolve

Priority Sector Financing in Timor-Leste

Defining each sector

Sector definitions based on the Timor-Leste Strategic Development Plan, 2011-2030

Timor-Leste priority sector	Definition
Education	Education and training are the tools used to improve the life opportunities of Timor-Leste people and enable them to reach their full potential. Projects include anything that reduced barriers to education across pre-school, primary, pre-secondary, secondary schools and vocational training and improve the education quality as well as facilities.
Electricity	Projects that support reliable electricity outside of Dili, focusing on the National Electricity Grid, natural gas and renewable energy.
Environment	Projects that impact land and sea management, biodiversity conservation, climate change adaptation and climate change mitigation (including access to renewable and efficient energy supplies).
Social inclusion and gender equity	Equitable and inclusive access to political, economic, social, and cultural life including access to social security and retirement incomes, education, housing, and employment opportunities.
Water and sanitation	Access to safe drinking water and sanitation as well as drainage in Dili, rural and district urban areas.
Rural development	Projects that support the challenges faced by those in rural areas.
Tourism	Unique offerings including tropical waters rich in marine life, white sand beaches, spectacular mountain ranges, Timorese culture, Portuguese colonial heritage and resistance history. As well as the calendar of special events, including the Tour de Timor bicycle race, the Dili 'City of Peace' Marathon and the Darwin to Dili Yacht Rally. Key markets include Eco and marine, historic and cultural, adventure and sports, religious and pilgrimage and conference and convention tourism.
Cultural heritage	Languages, dances, music and other forms of social and artistic expression preservation through cultural institutions, academies of art and creativity, craft, screen culture etc.
Sea and airports	Seaport infrastructure development, including buildings, wharfs and port volume growth at Tibar, Suai and regional ports. In addition to this, projects associated with Presidente Nicolau Lobato International Airport as well as Regional airports at Lospalos, Same, Viqueque, Suai and Baucau.
Private sector	Effort to attract investors to key industry sectors and partnering with international firms to infrastructure and support local firms start-up and grow. This also includes training to ensure there is the skills and support needed to identify business opportunities, start up a business, expand into new areas or markets, or start exporting.
Health	Good health is essential for a good quality of life. This includes access to good health care, nutritious food, clean drinking water and good sanitation. Focus areas in this sector is health services delivery, human resources for health and health infrastructure.
Petroleum	Core infrastructure, support industries and human resources to fully operate and manage the petroleum sector.
Agriculture	Investment in agriculture infrastructure, machinery and subsidised seed and fertiliser that support water security, farm modernisation and advice about the use of seeds, fertiliser and pesticides. This includes training, supporting food security, irrigation systems, fisheries, key commodities and forestry.
Telecommunications	Effective telecommunications that brings people together and supports the growth of businesses and the provision of Government services.
Roads and bridges	Core infrastructure necessary to support a modern and productive country. This includes Timor-Leste's system of national, regional and rural roads that provide access to the rural parts of the nation where the majority of the population lives.

Priority Sector Financing in Timor-Leste

Education, electricity, environment, social inclusion and gender equity as water and sanitation were found to be priority sectors for investment in Timor-Leste.

Results of the priority sector assessment

The following table summarise the results of the priority sector assessment, using the criteria and ratings outlined in the Approach. Of the 15 sectors assessed, the following were found to have the highest relevance to FCDO:

- Education
- Environment
- Social inclusion and gender equity
- Water and sanitation
- Others: Rural development, tourism, cultural heritage, and private sector

Timor-Leste priority sector	FCDO can value add in the sector	Requires additional funding	Support required to improve access to funding/financing
Education	Explore further	Explore further	Possible
Electricity	Possible	Possible	Explore further
Environment	Explore further	Explore further	Possible
Social inclusion and gender equity	Explore further	Explore further	Possible
Water and sanitation	Explore further	Possible	Explore further
Rural development	Explore further	Explore further	Possible
Tourism	Explore further	Explore further	Possible
Private sector	Explore further	Explore further	Possible
Cultural heritage	Possible	Explore further	Explore further
Sea and airports	Possible	Low priority	Explore further
Health	Explore further	Possible	Possible
Petroleum	Explore further	Possible	Possible
Agriculture	Possible	Possible	Explore further
Telecommunications	Possible	Low priority	Possible
Roads and bridges	Possible	Low priority	Low priority

LEGEND

Low priority

Possible

Explore further

Education

Compared to other revenue-generating investments, education has relatively low funding levels. Funded projects are rarely linked to climate change adaptation and resilience outcomes.

Key findings

- Insufficient investment compared to sectors with revenue-generating opportunities.
- Lack of consistent annual funding options, with sector not receiving consistent funding. Since the infrastructure was damaged in 1999, significant resources have been invested into construction, however insufficient towards disaster resilience.
- General lack of policy response on climate change across all levels, despite the National Adaptation Plan identifying the need to include in primary and secondary curricula. Annual action plans for the education sector do not include climate actions, driving public financing.
- Data on the impacts of climate change and natural disasters on the sector is missing.
- Budgetary allocations for the education sector should match the climate policies on climate awareness curricula at all levels.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	There is insufficient public awareness and understanding of the education sector's vulnerability to climate change, and as such there is little funding to support activities around climate adaptation or mitigation in the sector. FCDO could support through technical assistance to improve understanding of the impact of climate change on the sector and provide financing for targeted activities through MDBs or other on the ground NGOs.
FCDO can value add in the sector	FCO can raise awareness of the link between climate change and education, particularly around natural disasters and increased public financing.
Requires additional funding	Low expenditure compared to other sectors. The sector has inconsistent annual spending.
Support required to improve access to funding/financing	This sector is reliant on government funding, supplemented by MDBs and supported NGOs. This sector could benefit from financing by FCDO.

Summary

Number of climate relevant projects reviewed	9
Total value of climate relevant projects reviewed (2012-2025)	US\$ 20.8M
Net ODA per sector (2020) ¹⁴	US\$ 47.5M

Public financing

Various projects:

- Agro-ecology based school garden programme¹²
- Establish an attractive environment to promote learning through school environmental activities¹²
- Providing students emergency support against natural disasters ¹²
- Coordination and development of national environmental education policy ¹²
- Green School ¹²
- HATUTAN Education and Nutrition Programme ¹²
- Introduce and implement education programmes for citizenship and education for sustainable development ¹²

Agency: Consolidated Fund of Timor-Leste

Value: US\$ 163,187 (over 4 years)

Alignment to climate financing: Climate adaptation project

Multilateral banks

Highlighted project: *Basic Education Strengthening and Transformation Project* ¹⁵

Agency: World Bank
Value: US\$ 15 million

Goal: The goals for this project:

- Proving equitable and efficient school facilities and programs
- Develop infrastructure planning guideline's
- Improving teaching and principal leadership in early grades
- Supporting project management and monitoring and evaluation.

Loan terms: Provide adequate staffing, adopt Project Operations Manual, principal amount of the credit repayable is 1% from 2030 to 2040 and 2% from 2040 to 2060

Alignment to climate financing: Climate change is a key theme as per project documentation

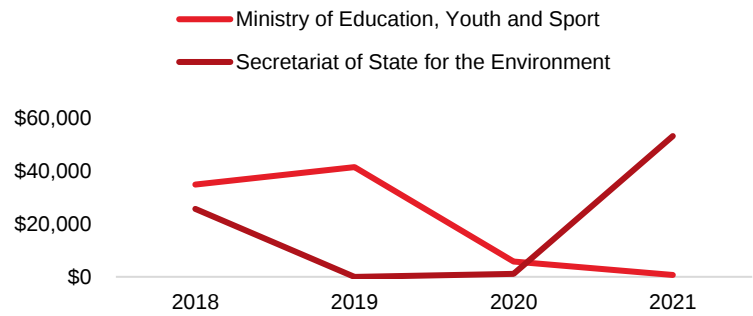


Figure 2.1: Climate relevant public financing ¹²

Private sector

The sector has insufficient focus from Government to drive MDB or public support. There is a strong opportunity for both financial and technical assistance to develop bankable investments.

Key findings

- Insufficient funding from multilateral and public sources, lack of private financing.
- Lack of relevant Government policies. Opportunity to develop policy positions and to implement them to mitigate the impact of climate change.
- Opportunity for technical assistance to further develop capabilities in the private sector and to further explore available funding options.
- Sector has the capability to have bankable investments.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	Although it requires more Government focus, FCDO could provide technical assistance to increase training or create private sector led PPPs, delivered through MDBs. However unclear definition suggests this is a lower priority sector.
FCDO can value add in the sector	There is a lack of Government focus or interest, resulting in insufficient policy, through which FCDO could provide technical assistance. FCDO could support attracting investors, and creating opportunities for growing businesses or start-ups.
Requires additional funding	Lack of significant funding compared to other sectors.
Support required to improve access to funding/financing	Sector lacks maturity and the training required for efficient deal structuring, investment attraction creating an opportunity for FCDO to build capacity. There could be an opportunity for private sector led PPPs, supported by FCDO, delivered through MDBs.

Summary

Number of climate relevant projects reviewed	13
Total value of climate relevant projects reviewed (2018-2021)	US\$ 5.2M
Net ODA per sector (2020) ¹⁴	-

Multilateral banks

*Pacific Renewable Energy Program (regional project)*¹³

Agency: Asian Development Bank (Government of New Zealand, Canadian Climate Fund for the Private Sector in Asia)
Value: US\$ 3M (financed on grant basis), US\$ 20M (approved on project-by-project basis)

Goal: Provision of an umbrella facility to provide financing support including loans, guarantees and letters of credit, to overcome the constraints to private sector investment in renewable power projects in Pacific island countries.

Alignment to climate financing: Climate mitigation project

Developing and Implementing Private Sector Projects in Fragile and Conflict-Affected Situations and Small Island Developing States (regional project) ¹³

Agency: Asian Development Bank
Value: US\$ 2.42M

Goal: Funds to strengthen the capacity of current and potential private sector companies in transitional, fragile and conflict-affected situations and Small Island Developing States. The project will seek to strengthen climate change and gender impacts in private sector investment.

Alignment to climate change: Climate adaptation project, climate mitigation project

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Public financing

Hamenus Lixu Plastiku ¹²

Agency: Secretary of State for the Environment
Value: US\$ 351,124

Plastics Upcycling Alliance ¹²

Agency: Secretary of State for the Environment
Value: US\$ 374,462

Follow on Advisory and Training for the Maritime Related Industries of Timor-Leste ¹²

Agency: Ministry of Transport and Communication, Development Partners
Value: US\$ 4.5M

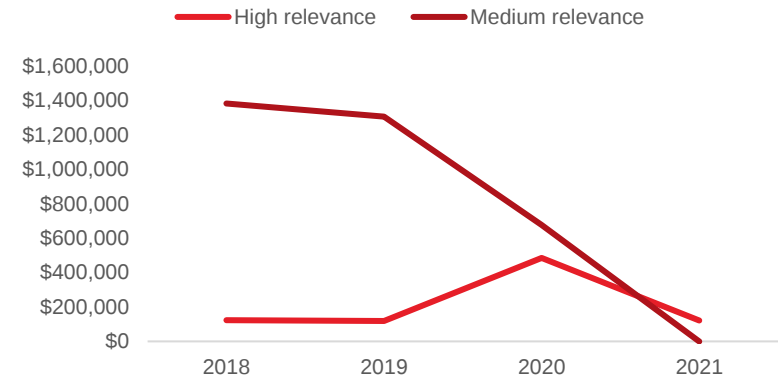


Figure 2.4: Private sector climate relevant public financing ¹²

Electricity

Sector dominated by regional projects funded by MDBs. There has been some public and private financing, which shows significant promise given the ability to use PPPs to create bankable investments.

Key findings

- MDBs fund few projects specific to Timor-Leste, with the sector dominated by regional projects.
- Sector has shown an understanding of resilience, with a shift towards renewable energy sources.
- Opportunity for regulatory frameworks in the sector that support climate change and resilience.
- Opportunity to facilitate introduction of renewable energy sources through financing options, which are bankable investment opportunities.
- Opportunity to introduce innovative financing models use models such as PPPs that shift the use of renewable energy to a household level.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	Despite relatively high investment in the sector, electricity continues to require investment, particularly in regional areas. FCDO can support through exploring blended finance models in the sector.
FCDO can value add in the sector	Although the sector already has funding and financing, FCDO can support through technical assistance in the delivery and implementation of new renewable energy projects. The FCDO can provide support to ensure the existing funding flows are efficiently targeted to renewable energy projects.
Requires additional funding	Sector is relatively well-funded in comparison with other sectors. However, opportunity exists for further investment in renewable energy sources.
Support required to improve access to funding/financing	Given energy is a sector with global experience in blended finance models, FCDO could leverage this and participate, particularly in renewable energy.

Summary

Number of climate relevant projects reviewed	6
Total value of climate relevant projects reviewed (2019-2022)	US\$ 74.1M
Net ODA per sector (2020) ¹⁴	US\$ 22.5M*

* Net ODA for all economic infrastructure, captures broader sectors

Private financing

Highlighted project: *Acquisition of Conergy’s Asia Pacific Solar PV Portfolio* ¹⁶

Agency: Green investment Group (Macquarie Capital)

Goal: The acquisition of a solar development portfolio, including solar development projects, asset monitoring centers, and energy storage capabilities.

Alignment to climate change: Climate mitigation project

Public financing

Develop renewable energy production plants ¹²

Agency: Ministry of Public Works

Value: US\$ 512,000

Alignment to climate change: Climate mitigation project

Install and maintain photovoltaic system ¹²

Agency: Ministry of Public Works

Value: US\$ 488,000

Alignment to climate change: Climate mitigation project

Multilateral banks

Highlighted project: *Power Distribution Modernization Project* ¹³

Agency: Asian Development Bank
Value: US\$ 36.7M

Goal: Support the modernisation of the power distribution system to contribute to the sustainability, resiliency, and reliability of the electricity system. Provide institutional strengthening and capacity building to the implementing agency, Electricidade De Timor-Leste to improve the power supply infrastructure.

Alignment to climate change: Climate mitigation project, Climate adaptation project

Loan terms: Technical Assistance, principal amount of the credit repayable 3.23% from 2027 to 2042.

Power Distribution Modernization Project – Additional Facility 2021 ¹³

Agency: Asian Development Bank
Value: US\$ 35M

Goal: The East Timor Government loaned \$US 35M to assist in providing renewable and reliable sources of electricity to 12 districts in the country. It aims to modernise Timor-Leste’s power distributing system and help underpin state-owned Electricidade de Timor-Leste’s (EDTL) oversee the electricity grid.

Loan terms: Technical Assistance, principal amount of the credit repayable 3.23% from 2027 to 2042.

Alignment to climate change: Climate mitigation project, Climate adaptation project

Environment

The sector has multiple links to other priority sectors, however has insufficient funding from all sources. There are a number of small public funded projects, highlighting the need to improve Government policy and capability.

Key findings

- Few projects with multilateral funding, insufficient public financing, no private financing in the sector.
- Robust Government policies exist to highlight priorities.
- Several small projects (total annual spend \$200k to \$3M) funded through Secretariat of State for the Environment, Ministry of Agriculture and Fisheries, Ministry of Social Solidarity and Inclusion, and Ministry of Transport and Communications.
- Opportunity for projects shielding environment and biodiversity from the impacts of climate change.
- Links to the agriculture and tourism sectors.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	Environment is a sector with strong Government policies, however these policies are poorly resourced by government. There is also limited awareness of potential opportunities for the private sector to engage. FCDO could improve this awareness or support access to various MDBs.
FCDO can value add in the sector	FCDO can raise private sector and general public awareness of the importance of investment in the sector.
Requires additional funding	Lack of significant funding compared to other sectors.
Support required to improve access to funding/financing	Although there is some capability in the sector, shown through existing Government policy, improved funding could be beneficial for technology and tourism-linked projects. FCDO could also support access to various MDB grants or loans for specific climate-resilient programs.

Summary

Number of climate relevant projects reviewed	37
Total value of climate relevant projects reviewed (2018-2021)	US\$ 41.2M
Net ODA per sector (2020) ¹⁴	US\$ 0

Public financing

*Strengthening Critical Resilience Capacities to Climate Change and Natural Disasters in Timor-Leste*¹²

Agency: Secretariat of State for the Environment, European Union, European Investment Bank

Value: US\$ 2.4M (Technical Assistance financed on grant basis)

Alignment to climate change: Climate mitigation project

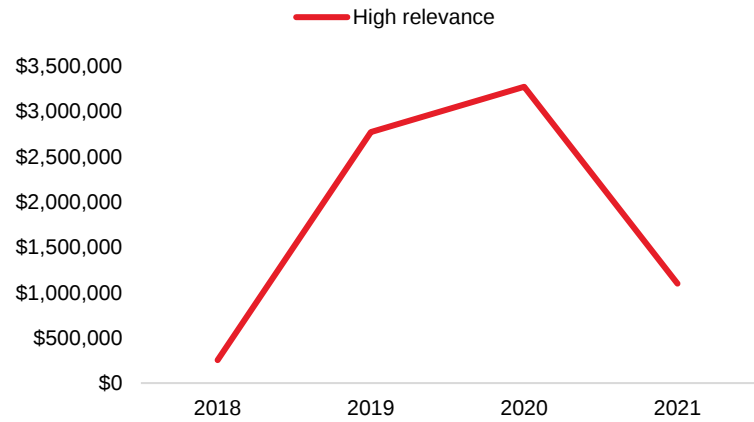


Figure 2.6: Environment climate relevant public financing ¹²

Multilateral banks

Highlighted project: *Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific* ¹³

Agency: Asian Development Bank
Value: US\$ 33M

Goal: To strengthen the management of coastal and marine resources in the coral triangle region, assisting member countries in fulfilling their Coral Triangle Initiative objectives, and engaging neighboring countries in addressing issues on coral reefs, fisheries and food security that continuously threaten coastal communities.

Alignment to climate change: Climate mitigation project

Terms: Technical Assistance financed on a grant basis

Empowering Developing Member Countries to Use Multispectral Satellite Images and Artificial Intelligence for Land Use and Coastal Planning (regional project) ¹³

Agency: Asian Development Bank and Republic of Korea e-Asia and Knowledge Partnership Fund

Alignment to climate change: Climate mitigation project

Value: US\$ 1M (technical Assistance financed on a grant basis)

Floods Emergency Response Project ¹³

Agency: Asia Pacific Disaster Response Fund

Alignment to climate change: Climate adaptation project

Value: US\$ 1M (financed on grant basis)

Sea and airports

Most projects currently have weak links to climate change, although there is a clear opportunity for investment. Further leveraging existing research and documentation could help influence stronger policy in the sector.

Key findings

- Most projects have a demonstrable link to climate change, but adaptation and resilience are not key themes.
- No public financing with climate relevance. Private financing and MDB loans focus on bankable and revenue generating investments.
- Potential impacts of climate change on the seaports and airports of are not addressed in any policy documents.
- Opportunity to use the Presidente Nicolau Lobato International Airport climate change assessment as a blueprint for public investment management in infrastructural development.
- Opportunity for localised research on climate change threats to sea and airports to raise strategic, political, and managerial awareness.
- Opportunity to develop an action plan to protect sea and airports from the impacts of climate change.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	FCDO could support Government in integrating climate change impacts into policy documents or fund climate related aspects of projects delivered by the private sector.
FCDO can value add in the sector	Given ability to generate revenues into the sector, there is smaller necessity for FCDO to intervene. However, these solutions often lack innovation. In addition to this, FCDO could support Government in integrating climate change impacts into policy documents.
Requires additional funding	Sufficient both private and public sector investment compared to other sectors, with recent investment into Presidente Nicolau Lobato International Airport.
Support required to improve access to funding/financing	Given there are strong revenue lines and potential private sector appetite, FCDO could support the climate related aspects of projects through funding if delivered by the private sector.

Summary

Number of climate relevant projects reviewed	4
Total value of climate relevant projects reviewed (2013-2018)	US\$ 458M
Net ODA per sector (2020) ¹⁴	US\$ 22.5M*

* Net ODA for all economic infrastructure, captures broader sectors

Private financing

Highlighted project: *Tibar Bay Port PPP*¹⁶

Agency: Bollore Africa Logistics of France, SDV Logistics East Timor
Value: US\$ 279M

Goal: Construction of a green-field port, located 10km west from Dili in Tibar Bay. The project includes the construction of a 630m wharf.

Alignment to climate change: Climate adaptation project
Terms: 30-year Design, Build, Finance, Operate, Transfer model.

Multilateral banks

Highlighted project: *The Presidente Nicolau Lobato International Airport Expansion Project* ¹³

Agency: Asian Development Bank
Value: US\$ 44M (grant), US\$ 135M (loan)

Goal: Lengthen and widen the runway, develop ICAO-specified Runway End Safety Areas, and upgrade the current Air Traffic Control Tower. The project will support national productivity by ensuring better connectivity of its people within and outside of the country.

Alignment to climate change: Climate adaptation project
Loan terms: Principal amount of the credit repayable 2.33% from 2027 to 2048.

Southeast Asia Aviation: COVID-19 Impact and Short-term Strategy ¹³

Agency: Asian Development Bank
Value: US\$ 200,000 in Technical Assistance
Alignment to climate change: Climate mitigation project
Loan terms: Technical Assistance, loan terms not currently available.

Capacity Building for Presidente Nicolau Lobato International Airport Expansion Project ¹³

Agency: Asian Development Bank
Value: US\$ 200,000
Alignment to climate change: Climate change is a key theme as per project documentation
Loan terms: Technical Assistance, loan terms not currently available.

Social inclusion and gender equity

Most funds go towards urgent humanitarian help, rather than projects promoting systemic change. Most support treats the symptoms rather than root cause of both climate change and inequality.

Key findings

- Most projects in this sector are regional projects or projects targeting several countries tackling similar issues. Insufficient funding directed specifically to Timor-Leste.
- Opportunity for the Government policy to address the special climate vulnerability of children and persons with disabilities.
- Timor-Leste spend often exceeds budget due to urgent humanitarian help in this sector, meaning that funding and financing targets the symptoms instead of the root causes. Reducing the risk of major disasters, expanded social protection programs, malnutrition and better education for women for example could help reduce the impacts of climate induced natural disasters to lessen the dependence on post-disaster humanitarian aid.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	FCDO can support and assist in developing improved climate mitigation and adaption measures, moving away from reactive grant funding structures to targeted and collaborative funding schemes, collaborative funding with public and private finance institutions and capacity building as well as outcome based grants.
FCDO can value add in the sector	The sector is particularly affected by climate change and should receive targeted focus in disaster recovery and recovery efforts. FCDO can support improved adaption measures, acknowledge the specific challenges faced by different groups and communities and seek to address these disparities in disaster management and recovery processes, as well as through improved preparation.
Requires additional funding	Lack of significant funding compared to other sectors.
Support required to improve access to funding/financing	With funding available on grant basis with little Government influence due to the responsive nature of most investment, FCDO could create opportunities to move towards adaptation and preparation, and away from reactive measures, particularly as this sector is interrelated with several others

Summary

Number of climate relevant projects reviewed	10
Total value of climate relevant projects reviewed (2018-2025)	US\$ 13.7M
Net ODA per sector (2020) ¹⁴	US\$ 52.5 M

* Net ODA for all social infrastructure, captures broader sectors

Multilateral banks

Highlighted project: *Timor-Leste COVID-19 and Health Systems Strengthening Support Project*¹⁵

Agency: World Bank
Value: US\$ 2.75M
Goal: To strengthen the capacities of communities in their preparedness for and response to COVID-19 and other health emergencies. This is by establishing surveillance at the grassroots level and improving community awareness, knowledge, attitudes, and behavior.
Alignment to climate change: Climate adaptation project
Loan terms: Financed on a grant basis

Other relevant projects

Project: Operations, Knowledge, and Analytics Support in Fragile and Conflict-Affected Situations and Small Island Developing States¹³
Agency: Asian Development Bank
Value: US\$ 1.3M
Alignment to climate change: Climate adaptation project
Loan terms: Technical Assistance financed on a grant basis

Project: Integrating Gender and Social Inclusion Dimensions in Climate Change Interventions in Southeast Asia¹³
Agency: Asian Development Bank
Value: US\$ 1.35M (technical assistance)
Alignment to climate change: Climate adaptation project

Public financing

Project: Humanitarian Support for Flood Response in Dili, Timor-Leste¹²
Agency: Department of Foreign Affairs and Trade (Australia)
Value: US\$ 7M

Project: Supporting Flood response and recovery ¹²
Agency: United Nations Development Programme
Value: US\$ 123,597

Project: Emergency support for affected community of disaster - Population affected by natural disaster were received little things - kitchen utensils ¹²
Agency: Ministry of Social Solidarity and Inclusion
Value: US\$ 40,000

Project: Humanitarian Aid (immediate and timely) -Families victims of natural disasters received building materials ¹²
Agency: Ministry of Social Solidarity and Inclusion
Value: US\$ 25,972

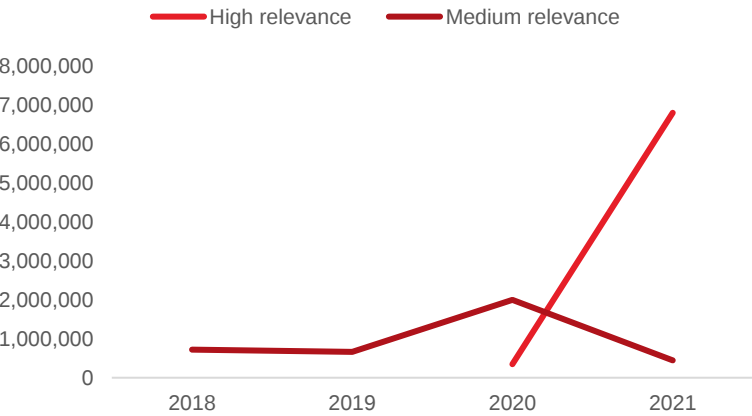


Figure 2.5: Private sector climate relevant public financing ¹²

Water and sanitation

The sector has few large impact projects with strong links to climate change or resilience. There is a clear opportunity to further develop policy in the sector.

Key findings

- Climate relevant projects are primarily funded by MDBs.
- There are minimal projects with medium or high climate relevance.
- Limited policy declarations, with an opportunity to develop policy and action plans.
- Opportunity to provide technical assistance in the water and sanitation sector.
- Opportunity to embed climate proofing water and sanitation infrastructure in the public investment management process.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	FCDO can play a role in providing technical assistance to help discover and create awareness of the strong links the sector has to climate resilience. It can also top Government funded initiatives to support projects that are short on funding.
FCDO can value add in the sector	Given that MDBS primarily fund medium sized projects, FCDO can assist in providing technical assistance and support the delivery and implementation of smaller climate mitigation and adaption projects in the sector. This is particularly important for projects with strong links to climate resilience.
Requires additional funding	With some funding available, particularly in medium sized projects, funding required is not as substantial as other sectors, but there is still a potential funding opportunity for smaller projects.
Support required to improve access to funding/financing	With limited policy declarations and focus, FCDO could help attract further funding, or work with MDBs, NGOs or other private sector bodies. FCDO could top up Government funded programs in water and sanitation to realise marginal projects that are otherwise short on funding.

Summary

Number of climate relevant projects reviewed	25
Total value of climate relevant projects reviewed (2008-2021)	\$US 988.5M
Net ODA per sector (2020) ¹⁴	US\$ 22.5M*

* Net ODA for all economic infrastructure, captures broader sectors

Public financing

Australia -Timor-Leste Partnership for Human Development – Sanitation (and Water) Sector ¹²

Goal: Aid the Government in financing and delivering additional 400 water systems for 25,000 rural households, including delivering effective operations and maintenance beyond basic repairs.

Alignment to climate change: Climate adaptation project, Climate change mitigation project

Agency: Ministry of Public Works, Infrastructure Fund
Value: US\$ 4M

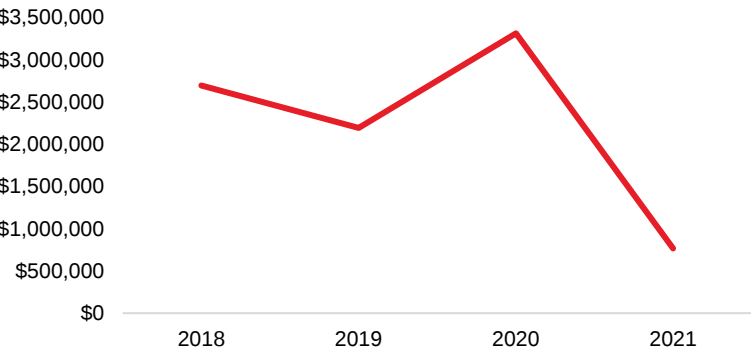


Figure 2.8: Water and sanitation climate relevant public financing¹²

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Multilateral banks

Highlighted project: *Dili Water Supply Projects* ¹⁵

Agency: World Bank
Value: US\$ 560M

Goal: To deliver new climate-resilient water supply infrastructure to expand and improve the performance of water services. Supported by interventions to strengthen the water utility's operational performance.

Alignment to climate change: Climate adaptation project, Climate change mitigation project

Loan terms: Principal amount of the credit repayable is 2.94% from 2030 to 2046

Related projects:

- Dili Water Supply Performance Improvement (Japan Special Fund, US \$1M Technical Assistance)
- Dili Urban Water Supply Sector Project (Asian Development Fund, US \$6M grant)

Other relevant projects:

- Timor-Leste Water Supply and Sanitation Project (World Bank, US\$ 25M)¹⁵
- Water Supply and Sanitation Investment Project (World Bank, US\$ 3M grant, US \$47M loan)¹⁵
- Urban Water Supply and Sanitation Project (Japan Special Fund, US \$600,000)¹³
- Oecussi and Ermera Water Rehabilitation Project (ADB, US\$700,000)¹³
- District Capitals Water Supply Project (Asian Development Fund, US \$11M in grant)¹³

Other sectors – rural development, tourism, cultural heritage

These sectors influence economic growth, however have not received much focus or funding.

Rural development

Key findings

- Little funding is available for rural development from multilateral financing. The projects identified have no links to climate change.
- There is no standalone Government policy that exclusively addresses rural development in the context of climate change. However, climate policies in most other sectors directly and indirectly contribute to climate-responsive rural development.
- Opportunity to link multilateral funding in the sector to increase rural resilience against climate change.

Summary

Number of climate relevant projects reviewed	12
Total value of climate relevant projects reviewed (2018-2021)	US\$ 14.2M
Net ODA per sector (2020) ¹⁴	US\$ 52.5 M*

* Net ODA for all social infrastructure, captures broader sectors

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	The sector has strong alignment to several others. With insufficient MDB funding, FCDO could top up Government funded programs to realise marginal projects that are short on funding.
FCDO can value add in the sector	The sector has strong links to others, including agriculture, tourism, water and sanitation, which also have insufficient funding. FCDO can support in providing technical assistance in developing policy that contributes to climate-responsive rural development.
Requires additional funding	Insufficient funding, magnified by insufficient funding to related sectors (agriculture, social inclusion).
Support required to improve access to funding/financing	FCDO could support Government through financing intermediary parties to de-risk projects that might not otherwise be viable. FCDO could top up Government funded programs to realise marginal projects that are otherwise short on funding.

Tourism

Key findings

- Few publicly funded projects identified, with medium links to climate change.
- Lack of Government policy promoting climate sensitive tourism.
- Sector has capacity for bankable investments. Opportunity to provide technical assistance to develop and maintain ecotourism, while also promoting livelihood diversification.

Summary

Number of climate relevant projects reviewed	3
Total value of climate relevant projects reviewed (2018-2020)	US\$ 11.2M
Net ODA per sector (2020) ¹⁴	US\$ 52.5 M*

* Net ODA for all social infrastructure, captures broader sectors

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	With potential for Timor-Leste to tap into various MDB grants or loans for specific climate-resilient program for tourism assets, FCDO could support Government access these funds, or provide marketing assistance.
FCDO can value add in the sector	FCDO could support creating awareness in climate sensitive tourism. This could be through technical assistance to support businesses create eco-tourism opportunities or support to increase marketing efforts.
Requires additional funding	Insufficient funding, magnified by insufficient funding to related sectors (environment).
Support required to improve access to funding/financing	Sector has the capability to develop commercially viable investments. FCDO could business grants that upgrade existing assets or protect natural tourism assets that lead to tourism potential.

NOT FOR DISTRIBUTION

Cultural heritage

Key findings

- No projects with relevance to climate change were identified in this sector.
- Potential impacts of climate change on the culture and heritage of Timor-Leste are not addressed in any policy documents.
- Opportunity for localised research on how climate change threatens Timorese culture and heritage.
- Opportunity to provide technical assistance.

Summary

Number of climate relevant projects revieweda	0
Total value of climate relevant projects reviewed	US\$ 0
Net ODA per sector (2020) ¹⁴	US\$ 52.5 M*

* Net ODA for all social infrastructure, captures broader sectors

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	With difficult market entry, given its localized nature, MDBs have not invested strongly in the sector. FCDO could provide support in the form of technical assistance to increase the understanding between climate change and cultural heritage.
FCDO can value add in the sector	Currently, MDBs and private sector do not enter the market given it is a specialized local sector. FCDO could provide technical assistance that supports the development of localized research on the links between climate change and cultural heritage, particularly around incorporating traditional knowledge into activities.
Requires additional funding	No funding available for the sector.
Support required to improve access to funding/financing	Currently, Government has no clear capability in accessing funding/financing in the sector. FCDO may be able to provide direct funding into the sector.

Health

The sector already has significant investment from MDBs and public financing. Although the sector has strong alignment to FCDO capabilities and the ability to link health to between climate change, it already has funding and policy priority.

Key findings

- Several projects funded, both multilateral and public. Adequate funding in comparison with other key sectors.
- Well-developed policies in this sector, including Health National Adaptation Plan, co-developed with the World Health Organisation. Opportunity to embed priorities into annual action plans of relevant institutions.
- Funding applications demonstrate well the link between health and climate change.
- Need to diversify the source of health specific climate projects.
- Opportunity to fund the construction of climate resilient health infrastructure (hospitals and clinics).

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	Given there are already healthy levels of MDB and public funding and investment in the sector, the FCDO could support technical assistance that develops climate resilient infrastructure, or funding towards climate linked projects identified in the Health National Adaption Plan.
FCDO can value add in the sector	With the link between climate change and health explicitly demonstrated in most projects and therefore market response, FCDO can add value through further investment in the sector, and technical assistance to develop climate resilient health infrastructure.
Requires additional funding	Although the sector receives a relatively high amount of funding, the high burden of poor health and its interrelationship with other sectors means that further funding is required.
Support required to improve access to funding/financing	FCDO could provide grant funding for climate resilient health infrastructure which has been identified in the Health National Adaption Plan.

Summary

Number of climate relevant projects reviewed	29
Total value of climate relevant projects reviewed (2007-2022)	US\$ 101M
Net ODA per sector (2020) ¹⁴	US\$ 35M

Multilateral banks

Highlighted project: Various projects – COVID-19 response^{13,15}

Agency: World Bank

- Timor-Leste COVID-19 Response and Health System Preparedness Project (US \$5M)

Agency: ADB

- Supporting Enhanced COVID-19 Vaccination and Post-COVID-19 Health Security Response in Southeast Asia (US\$ 5.7M)

Goal: To prevent and respond to COVID-19 outbreak, strengthen national systems for health emergency preparedness, and support the rollout and expansion of covid vaccination.

Alignment to climate change: Climate adaptation project

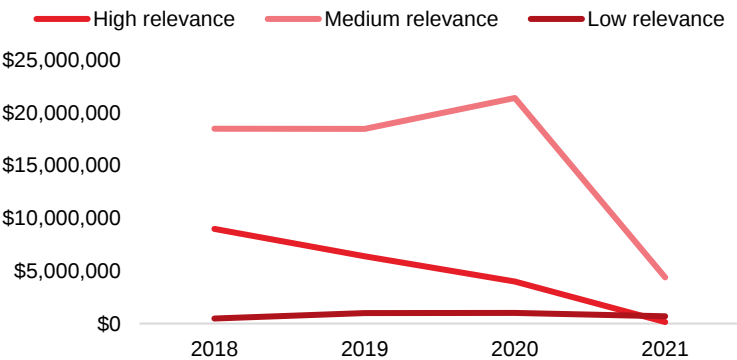


Figure 2.2: Health climate relevant public financing ¹²

NOT FOR DISTRIBUTION

Public financing

Highlighted project: National Malaria Programme¹²

Agency: Ministry of Health, World Health Organization
Value: US\$ 9.7M (financed on grant basis)

Goal: Well-funded programme, based on a technically strong strategy using a rapidly evolving health system that is providing basic health services down to the household level. In 2016, only 95 cases were reported compared to nearly 20,000 confirmed cases in 2011.

Alignment to climate change: Climate adaptation project

Other relevant projects:

Project: Reducing the Burden of Tuberculosis in the Democratic Republic of Timor-Leste¹²
Agency: The Global Fund and Ministry of Health
Alignment to climate change: Climate change is a key theme as per project documentation
Value: US\$ 6.4M (financed on grant basis)

Project: Pandemic Influenza Preparedness Framework¹²
Agency: Ministry of Health, World Health Organization
Alignment to climate change: Climate change is a key theme as per project documentation - Climate change resilience was one of the key themes in these projects, as infectious diseases are often climate-linked and populations experiencing heavy disease burden are less climate resilient
Value: US\$ 627,654

Petroleum

The sector currently has strong private sector investment, however the number of bankable investments are declining. There could be some opportunities for technical assistance for the transition to renewable sources.

Key findings

- No publicly or multilaterally funded projects identified.
- Abundant private financing in the sector.
- Urgent actions need to be taken to reduce Timor-Leste’s reliance on petroleum revenue and to diversity its economic base.
- Sector has rapidly declining capability for bankable investments.
- Lack of relevant policy documents addressing how the petroleum sector will be managed through the transition to green economy.
- Opportunity to provide technical assistance to the petroleum sector, assisting with the transition away from non-renewable resources.
- Although all the projects are climate relevant, they do not directly align with climate mitigation or adaption, therefore no direct alignment to climate change has been highlighted.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	With the sector reducing in attractiveness, and potential decline in reserves, FCDO can support Timor-Leste in developing policy towards transition, however without this, there is a reduced likelihood of investment attraction.
FCDO can value add in the sector	Given the clear gaps in the way sector addresses climate change adaptation, FCDO can provide technical assistance is supporting the transition, particularly in reducing the risk of reserve depletion and the financial impact.
Requires additional funding	The sector has some funding available; however declining bankable investments from the private sector.
Support required to improve access to funding/financing	With urgent action required to reduce reliance of the petroleum revenue, and lack of clear links to climate mitigation or adaption, funding could be provided by FCDO to MDBs, or through the provision of access to climate funds. However, without stronger policy around transition to green fuel sources, interest in the sector could be challenging.

Summary

Number of climate relevant projects reviewed	0
Number of projects reviewed	9
Total value of projects reviewed (2021-2022)	>US\$ 1.5B*
Net ODA per sector (2020) ¹⁴	US\$ 0

* not all transaction data is available

Public financing

Acquisition of 30% in Greater Sunrise Gas Fields¹²

Agency: Government of Timor-Leste
Value: US\$ 350M

Goal: The Greater Sunrise Fields consists of Sunrise and Troubadour gas and condensate fields. The Government of Timor-Leste acquired 30% ownership in the Greater Sunrise gas fields, owned by ConocoPhillips.

Acquisition of 26.56% in Greater Sunrise Gas Fields¹²

Agency: Government of Timor-Leste
Value: US\$ 300M

Goal: The Government of Timor-Leste acquired 26.56% ownership in the Greater Sunrise gas fields, owned by Shell.

Timor-Leste Petroleum House PPP¹²

Agency: Government of Timor-Leste
Value: no information available

Loan terms: The project will be developed on a design, build, finance, and maintain (DBFM) basis

Private financing

Highlighted project: ConocoPhillips Northern Australia Assets Acquisition Refinancing 2020¹⁶

Agency: Santos
Value: US\$ 750M

Loan terms: 5.25-year maturation.

Acquisition of 25% in Darwin LNG & Bayu-Undan Gas Field¹⁶

Agency: SK Group (Santos, SK E&S, Inpex, Eni, JERA, Tokyo Gas)

Sunrise Floating LNG Production Facility¹⁶

Agency: Woodside Energy, Osaka Gas, ConocoPhillips, Royal Dutch Shell

Acquisition of 50% in Buffalo Offshore Oil Field¹⁶

Agency: Advance Energy

Glas Dowr Floating Production, Storage, and Offloading (FPSO) Upgrade

Agency: ING Group, DnB NOR Bank, Natixis, NIBC Bank, BNP Paribas, Banque LBLux
Value: US\$ 144M

Loan terms: 5-year maturation

Agriculture

Public financing is the main source of climate-change relevant funding, with little multilateral financing and no private financing in the sector. There is a strong opportunity for FCDO to provide both financial and technical assistance.

Key findings

- Sizeable funding available in comparison with other priority sectors.
- Technical assistance may be required to realize bankable investments through the inclusion of novel technologies or research partners. This is starting to be realized with the introduction of carbon credit projects such as WithOneSeed which is drawing capital investment.
- Relevant Government policies exist but are underfunded. Capacity of institutions to utilize the allotted budget should be strengthened.
- Opportunity to attract more investment from development partners for agriculture sector. Existing cooperation agreement between Timor-Leste and China may stimulate more opportunities, especially ones with bankable investments (coffee, vanilla, spices).
- Links to other sectors (rural development, social inclusion and gender equity) can be used to promote climate change adaptation outcomes in both sectors.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	Although the sector has a reasonable level of investment compared to others, FCDO has an opportunity to provide technical assistance, or attract carbon credit and offset projects.
FCDO can value add in the sector	The sector is primarily funded by publicly financed projects with relatively lower degrees of funding from private funding and is also supported by some multilateral partners. FCDO could provide technical assistance, create governance structures or create market awareness in the growing availability of bankable investments in the sector.
Requires additional funding	Funding gap is still present, even though the sector receives significant funding in comparison with other sectors.
Support required to improve access to funding/financing	FCDO could help attract or support creating carbon credit projects. They could also find partners for climate resilient agriculture projects with local farmers.

Summary

Number of climate relevant projects reviewed	47
Total value of climate relevant projects reviewed (2010-2024)	US\$ 153.7M
Net ODA per sector (2020) ¹⁴	US\$ 25M *

* Net ODA for all production,

Multilateral banks

Highlighted project: *Coffee and Agroforestry Livelihood Improvement Project* ¹³

Agency: Japan Fund for Prosperous and Resilient Asia and the Pacific
Value: US\$ 3M (financed on grant basis)

Goal: Household training on good agricultural practices for production of coffee and related crops and provided better access to finance. Strengthen industry management and support initiatives to improve coffee quality and linkages with key markets.

Alignment to climate change: Climate adaptation project

Promoting Climate-Resilient and Sustainable Blue Economies (regional project) ¹³

Agency: Asian Development Bank
Value: US\$ 2.7M (technical assistance financed on grant basis)

Goal: Sustainable management of marine and coastal resources for resilience in Pacific Island economies. Strengthening the blue economies to alleviate poverty in vulnerable communities which depend directly on healthy coastal and marine ecosystems for food and livelihood.

Alignment to climate change: Climate adaptation project

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Public financing

Highlighted project: *Avansa Agrikultura Project* ¹²

Agency: Ministry of Agriculture and Fisheries, Feed the Future, Global Climate Change Initiative
Value: US\$ 10M (financed on grant basis)

Goal: Horticulture value chain activity that aims to increase productivity in farming, production, processing, and distribution of vegetables, fruits, and legumes. Stimulates and support increased economic activity and growth in targeted rural communities and districts in Timor-Leste.

Alignment to climate change: Climate adaptation project

Other relevant projects:

Project: Building shoreline resilience of Timor-Leste to protect local communities and their livelihoods ¹²

Agency: Ministry of Agriculture and Fisheries, United Nations Development Programme
Alignment to climate change: Climate adaptation project
Value: US\$ 5.5M (financed on grant basis)

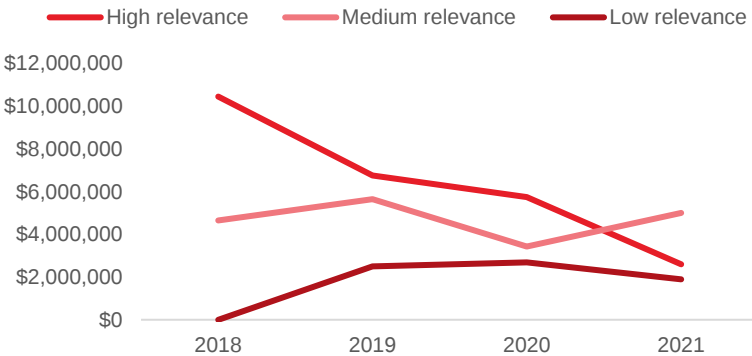


Figure 2.3: Agriculture climate relevant public financing ¹²

Telecommunications

The sector already has strong public focus for national scale projects. Regional projects are a major focus of MDBs, however the impacts of climate change on the sector has not been clearly outlined in policy.

Key findings

- Funding available from MDBs and public funding. Multilateral financing focused on large regional projects.
- National level projects funded through public budget allocations.
- Public financing focused on increasing connectivity, linking communications wit rural development.
- Potential impacts of climate change on the telecommunications sector of Timor-Leste are not addressed in any policy documents.
- Opportunity in integrate climate proofing telecommunications infrastructure as an integral part of public investment management.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	The sector is lower priority, with already strong public investment in the sector. FCDO could broker deals or create partnerships in the sector or provide technical assistance for climate policy integration.
FCDO can value add in the sector	Given there are already innovative solutions in the sector through public and MDB funding, lower priority for FCDO. However, FCDO could support the integration of climate mitigation and adaption into policy documents.
Requires additional funding	Sufficient funding available in comparison with other sectors.
Support required to improve access to funding/financing	Public allocation to the sector is strong, however there remains a potential for stronger private sector links. FCDO could create relationships with the private sector, support potential bond issuance, or access to climate funds.

Summary

Number of climate relevant projects reviewed	7
Total value of climate relevant projects reviewed (2018-2021)	US\$ 64.7M
Net ODA per sector (2020) ¹⁴	US\$ 22.5M

* Net ODA for all economic infrastructure, captures broader sectors

Public financing

National Connectivity Project¹²

Agency: Ministry of Transport and Communications (Infrastructure Fund)
Value: US\$ 688,000

Extension of the Fiber-Optical Network PCN II¹²

Agency: Ministry of Transport and Communications (Infrastructure Fund)
Value: US\$ 3.6M

Study on Installation of Optical Fiber¹²

Agency: Ministry of Planning and Ordination (Infrastructure Fund)
Value: US\$ 3.1M

Satellite Internet Connectivity Upgrade from 20 Mbps to 60/80 Mbps¹²

Agency: Ministry of Transport and Communications (Infrastructure Fund)
Value: US\$ 3.8M

Multilateral banks

Highlighted project: Asia-Pacific Remote Broadband Internet Satellite Project (regional project) ¹³

Agency: Asian Development Bank
Value: US\$ 25M

Goal: Construction, launch, and operation of a shared, geostationary earth orbit, high-throughput satellite, featuring Ka-band technology, which will be dedicated to low cost, high-speed, easily accessible broadband internet in Asia and the Pacific. Through the availability of broadband based technologies, the project can assist in climate adaptation and disaster resilience as well as climate-smart agricultural practices.

Alignment to climate change: Climate adaptation project

Loan terms: Information confidential.

Developing Public-Private Partnership Projects in Digital Transformation (regional project)¹³

Agency: Asian Development Bank
Value: US\$ 2.95M

Goal: Development of digital transformations, i.e., the process of using digital technologies to create new or enhance existing business processes, culture, and customer experiences to accommodate evolving business and market requirements. Through the involvement of private sector this project will deliver more innovative and sustainable infrastructure and services.

Alignment to climate change: Climate change is a key theme as per project documentation

Loan terms: Technical Assistance provided on grant basis.

Roads and bridges

Well-funded sector, with almost all public expenditure focused on increased resilience in the sector. There are also well-documented links to investment and climate change adaptation.

Key findings

- In comparison with other sectors, roads and bridges form a well-funded climate-relevant portfolio. Funding is available from all sources.
- Almost all public expenditure in this sector is directed towards increasing resilience in the sector.
- Opportunity to further enhance flood resilience through research, planning, and design.
- Opportunity to integrate climate- and disaster-resilient construction of roads and bridges into public investment management process.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	The sector is quite mature, with funding already available from a number of sources. There may be some opportunities for technical assistance through design for disaster resilience.
FCDO can value add in the sector	There are a variety of projects funded (roads, public transport), although there is an opportunity for technical assistance to support flood resilience through design, and integration of climate-and disaster resilience into construction.
Requires additional funding	Funding available via public financing, private financing, and multilateral banks.
Support required to improve access to funding/financing	Mature sector, with numerous projects, and few bankable investment opportunities.

Summary

Number of climate relevant projects reviewed	92
Total value of climate relevant projects reviewed (2012-2022)	\$US 1.3B
Net ODA per sector (2020) ¹⁴	US\$ 22.5M

* Net ODA for all economic infrastructure, captures broader sectors

Public financing

Road Climate Resilience Project¹²

Agency: Ministry of Public Works, Infrastructure Fund

Value: US\$ 22M

Alignment to climate change: Climate adaptation project

60 Roads Project Implements Iha 12 Counties¹²

Agency: Ministry of Public Works, Infrastructure Fund

Value: US\$ 27M

Alignment to climate change: Climate adaptation project

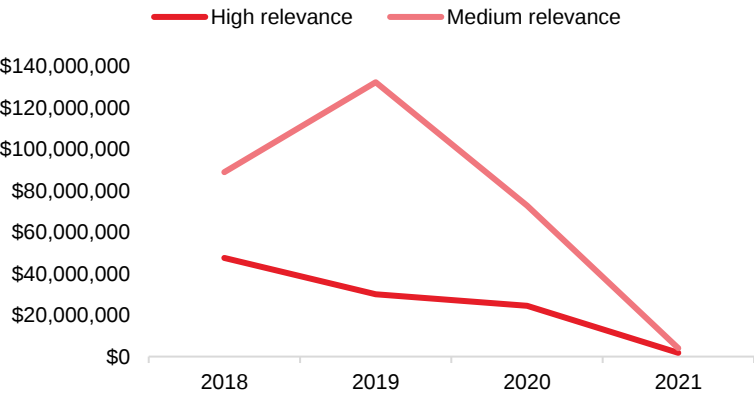


Figure 2.7: Roads and bridges climate relevant public financing¹²

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Private financing

Highlighted project: Suai-Betano-Beaco Highway Construction Project¹⁶

Agency: Eximbank

Value: US\$ 298M

Alignment to climate change: Climate adaptation project

Multilateral banks

Timor-Leste Public Transport Project¹³

Agency: Asian Development Bank

Value: US\$ 40M

Alignment to climate change: Climate adaptation project

Other relevant projects:

- Timor-Leste Branch Roads Project (World Bank, US\$ 59M loan)¹⁵
- Timor-Leste Road Climate Resilience Project/ Road Climate Resilience Project (World Bank, US\$ 55M loan)¹⁵
- Lautem-Com, Lautem-Los Palos an Las Palos-Viqueque Road Portfolio (ADB, US\$ 145M loan and technical assistance)¹³
- Road Sector Improvement Project (Asian Development Fund, US\$10M grant) ¹³
- Road Network Development Sector Project (Asian Development Fund, US\$46M grant) ¹³
- Road Network Upgrading Project (ADB, Asian Development Fund, JACA, European Union, US\$22.6M in grant, US\$100M loan) ¹³
- Road Network Upgrading Sector Project (Asian Development Fund, US\$10M in grant, US\$120M loan) ¹³
- Dili to Baucau Highway Project (Asian Development Fund, US\$49M loan) ¹³

Other sectors – not previously identified as priority sectors

Governance

Key findings

- Governance can play a key role in climate change adaptation on a national and regional level, aiding other sectors to realise their goals.
- Insufficient funding on a national level towards capability development, structures and leadership capabilities.
- Institutional arrangement for realizing the cross-sectoral national capacity development for fighting the impacts of climate change as stipulated in Timor-Leste's INDC should be ascertained.
- Relevant divisions under the Ministry of Public Works should be sensitized about the role they have to play in developing climate resilient housing, general infrastructure, urban planning, and public works; and key performance indicators (KPIs) for measuring their climate action relevant performance should be sited.
- Opportunity for technical assistance to develop structures and leadership capabilities allowing the region to act as a cohesive block.

Suitability for FCDO investment

Criteria / rating	Rationale
SUMMARY	Governance plays a key role in a number of other sectors, as such FCDO can provide either technical assistance or direct funding for leadership and capability development.
FCDO can value add in the sector	With limited scope for the private sector to value add to governance sector, FCDO have provide technical assistance.
Requires additional funding	Insufficient funding available on national level.
Support required to improve access to funding/financing	Opportunity for FCDO to provide funding for MDBs to provide capability development and support leadership capabilities.

Summary

Number of climate relevant projects reviewed	3
Total value of climate relevant projects reviewed (2005-2011)	\$US 725,000
Net ODA per sector (2020) ¹⁴	\$US 7.5M

Multilateral financing

Highlighted project: *Accelerating Climate Transitions through Green Finance in Southeast Asia (regional project)* ¹³

Agency: Asian Development Bank
Value: US\$ 15M

Goal: The project will provide a regional platform to help developing member countries in Southeast Asia mobilize public and private finance for commitments under the Paris Agreement, including nationally determined contributions and the Sustainable Development Goals. ACT will respond to ADB's elevated ambition to deliver \$100 billion in climate finance from 2019 to 2030. It will leverage support from the Asian Development Bank and ASEAN Catalytic Green Finance Facility financing partners to strengthen upstream planning, project origination, and capacity to accelerate a pipeline of green projects for the region. The project will mobilize \$750 million in climate finance that, combined, could reduce 450,000 tons of carbon dioxide equivalent per year.

Alignment to climate change: Green finance

Loan terms: Technical Assistance financed on grant basis

Multilateral financing

Support for Achieving the Strategic Development Plan 2011-2030 and the Sustainable Development Goals ¹³

Agency: Asian Development Bank
Value: US\$ 500,000

Description: This project assisted the Government of Timor-Leste strengthen its development planning and improve linkages between planning and budgeting. This work was supported through a policy note, piloting the development of a medium-term expenditure frameworks for a selected ministry, and analyses to strengthen the alignment of plans with the Sustainable Development Goals.
Alignment to climate change: Climate adaptation project, Climate mitigation project
Loan terms: Technical Assistance financed on grant basis

Capacity Building to Strengthen Public Sector Management and Governance Skills, Phase III ¹³

Agency: Asian Development Bank
Value: US\$ 225,000

Description: The project developed the competencies of district officers, and extended support to sub-district officers and village leaders. The project was building on the existing relationship and work with Instituto Nacional de Administracao Publica of the Ministério da Administração Estatal (i.e., the National Institute of Public Administration of the Ministry of State Administration).
Alignment to climate change: Climate change is a key theme as per project documentation
Loan terms: Technical Assistance financed on grant basis

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