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Government of Republic of Timor-Leste

Intended Nationally Determined Contributions

1. Introduction

in accordance with the relevant paragraphs of Decisions 1/CP.19 ,1/CP.20 and 1/CP21 the Republic of Timor Leste hereby communicates its intended Nationally Determined Contributions (INDC) towards achieving the objective of the Convention as set out in its Article 2 in a manner that facilitates the clarity, transparency and understanding of the intended nationally determined contributions.

1.1 Summary

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF PARTIES		
PARTY: Republic of Timor-Leste		DATE: October 2016
Parameter	Information	
Period for defining actions (INDC implementation period)	Start year: 2020 End year: 2025	
Reference year or period	2010: 1,483 Gg CO ₂ e	
Coverage (Current emissions status by sector and gas)	National emissions (in percentage as of 2015)	Carbon dioxide, CO ₂ e, 466.87 Gg CO ₂ e (31%) Methane, CH ₄ , 548.56 Gg CO ₂ e (37%) Nitrous Oxide, N ₂ O, 467.18 Gg CO ₂ e (32%)
	Sectors	Agriculture, energy, land-use change & forestry, waste
	Gases	CO ₂ , CH ₄ , N ₂ O
	Geographical boundaries	Whole of country
Metrics and Methodology		Consistent with methodologies used in Timor-Leste's Initial National Communication (INC) that used the 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for Green House Gas (GHG) inventory.
Land sector accounting approach		N/A for Land Use.
Type and level of Contribution		<p>The INDC is an economy-wide document. Contributions are in the form of potential outcomes and actions in the covered sectors to promote sustainable development.</p> <p>Timor-Leste has made a conscious decision not to have a target for emission reduction, but outline the commitment to reducing emissions through various activities in sectors like transport, agriculture, forestry and energy. This will require International climate finance and assistance to develop an economy wide Green House Gas (GHG) Inventory. The Second National Communication process has initiated the GHG inventory preparation for Timor-Leste for 2012-2017.</p>
Adaptation		Priority adaptation areas are identified in relation to food security, water resources, health, natural disasters, forestry, biodiversity and coastal ecosystem resilience, livestock production and physical Infrastructure. For

	medium to long term adaptation priorities, Timor-Leste is pursuing formulation of the National Adaptation Plan (NAP).
Fairness, Equity and Ambition	Timor-Leste's emissions are less than 0.003% of global emissions, one of the lowest from any Parties, negligible in the global context. It is also highly vulnerable to climate change. Despite being a Least Developed Country, Timor-Leste has carried out various efforts to increase its climate resilience.
Narrative supporting the fair-share assessment of the contribution	Timor-Leste is a LDC and SIDS with negligible levels of emission but is extremely vulnerable to climate change impacts. Hence the decision to focus on adaptation to deal with the current and future climate induced impacts.

2. Timor-Leste's National Circumstances and Commitment to Climate Change

2.1 National Circumstances

Timor-Leste became the youngest nation in the South East Asian region when it restored its independence from Indonesian occupation in 2002. It has faced several challenges in rebuilding its infrastructure after the 24-year struggle for independence. Timor-Leste has managed to overcome these and other challenges and has even managed to become a model country in terms of reconciliation, border dispute resolution and of transparent financial management.

Geographically, Timor-Leste (TL) is located at the eastern end of the Lesser Sunda archipelago, between latitudes 8'15 and 10'30 south and longitudes 124'50 and 127'30 east. Timor-Leste occupies the eastern half of Timor Island and includes an enclave within the Indonesian province of West Timor (Timor- Kupang), To the north, TL is met by the Sawu Sea and Straits of Wetar, To the South, the Timor Sea fills the 500 km gap between I L and Australia¹. TL occupies a land area of about 15,954 square kilometres. This includes the main land area of 13,989 km², Oecusse enclave of 817 km², Atauro Island of 140 km² and Jaco Island of 8 km². The country topographically is characterized by hills and mountains - about 44 % of the Island has a slope of 40 % or more that causes soil erosion during heavy rainfall.

For administrative purposes, Timor-Leste is divided into 13 Municipalities; Aileu, Ainaro, Baucau, Bobonaro (Maliana), Cova-Lima (Suai), Dili, Ermera (Gleno), Lautem (Lospalos), Liquica, Manatuto, Manufahi (Same), Oecussi (Ambeno), Viqueque, According to the 2015 Population and Housing Census, the population of Timor-Leste was estimated as 1,183,643 people. Current population density is approximately 79.3 per square kilometres², which is considered as one of the lowest in the South East Asian region. The most populated Municipalities (with higher than 100,000 population) are Dili, Ermera and Baucau. Bobonaro, Viqueque, Liquica, Oecusse, Ainaro, Covaiima and Lautem have population figures in the range of 60,000 to 100,000. The Municipalities with less than 60,000 population are Manufahi, Aileu and Manatuto.

The population growth rate is approximately 1.8% per year³, which is one of the highest in the region. Approximately twenty nine percent (29.5%) of the population lives in the urban areas with an estimated annual rate of urbanisation at 2.09% over the period of 2010-2015.⁴ Poverty remains as a major challenge, while unemployment and underemployment are still relatively high. Following international extreme poverty standards, about 30.3% of the population is estimated to live below the poverty line in 2014, compared to 47.2% in 2007.⁵

in addition, household food insecurity is widespread throughout all rural areas. The low input practices of agricultural systems, low crop productivity, unpredictable changes to the annual seasons, characterised by heavy rainfall and an intense dry season as well as a high rate of population growth are the major contributors to food insecurity in the country.

As a new country, the main challenges faced by Timor-Leste include low education, rapid population growth, high rates of rural-urban migration, high rates of unemployment especially amongst the youth, depletion of natural resources, food insecurity, poverty, vulnerability to natural hazards and climate change.⁶ Moreover, as in all other countries in the world, the livelihoods of Timorese people depend on a healthy and productive environment, Timor-Leste's Human Development Index (HDI) value for 2014 was 0.595— which put the country in the medium human development category—positioning it at 133 out of 183 countries and territories. Between 2000 and 2014, Timor-Leste's HDI value increased from 0.465 to 0.595, an increase of 27.1 percent or an average annual increase of about 1.73 percent.⁷

Timor-Leste has also faced great challenges in rebuilding its infrastructure, strengthening the civil administration, and generating jobs for young people entering the work force. The development of offshore oil and gas resources has greatly supplemented government revenues. This technology-intensive industry, however, has done little to create jobs in part because there are no production facilities in Timor-Leste. Timor-Leste's crude petroleum resources are currently processed abroad, but Timor-Leste has expressed interest in developing a domestic processing capacity. There is an opportunity to develop this industry in accordance with best practices, to capitalize on technological advancements and minimize GHG emissions,

However, with all these challenges, Timor-Leste has made notable progress in addressing issues of poverty, unemployment, environmental degradation, peace building and state building. Timor-Leste has benefited from offshore oil and gas deposits and has established a system to define national development priorities, which have been identified through the National Priorities Process (NPP).

Timor-Leste has achieved a notable decrease in poverty, double digit economic growth and wide improvements in health and education. Moreover, the country is achieving high transparency while managing oil revenues, becoming one of the eleven fully compliant countries in the Extractive Industries Transparency Initiative (EITI). The government is working hard to consolidate efforts to lay a strong foundation in order to build a prosperous nation. The key underlying economic policy challenge the country faces remains on how best to use oil-and-gas wealth to lift the non-oil economy onto a higher growth path and to reduce poverty.

Total Gross Domestic Product (GDP) in current prices for Timor-Leste in 2014 was \$4,175 million, out of which the oil industry accounted for \$2,774 million (66.4% of total GDP) and the non-oil industry accounted for \$1,400 million (33.6% of total GDP).⁸ The per capita GDP in current prices was USD 3,566 in 2014. Notably in 2014, on one side the Oil GDP decreased by 39.9% while the non-Oil GDP increased 5.9% following the GDP expenditure approach. The Non-Oil GDP was driven by the Public Sector Government (+23.2%) and the Private Sector (+10.6%). For two consecutive years, the private investment has increased more (+17.3%) than private consumption (+9.8%). Timor-Leste expects the oil and gas sector to play a significant role in its economic development in the medium-term.

2.2 Climate Change Actions

Timor-Leste has put in place the following institutional arrangements to manage its response to climate change:

- Establishment of National Focal Point for the UNFCCC in 2006.
- Establishment of National Directorate for International Environmental Affairs and Climate Change under the Secretariat of State for Environment in 2007, and recently changed its name to National Directorate for Climate Change (NDCC) under the Ministry of Commerce, Industry and Environment. This Directorate serves as the hub of all GoTL's engagement in climate change related issues.
- Timor-Leste has established a National Designated Authority (NDA) for Clean Development Mechanism (CDM) for facilitating CDM projects.
- Timor-Leste established its National Focal Point for Green Climate Fund (GCF), A readiness proposal has already been accepted by the GCF Secretariat and U\$300,000 funding request has been approved to establish the National Designated Authority (NDA) for GCF, preparation of the National Implementing Entities (NIEs) and capacity building.
- The Ministry of Commerce, Industry and Environment, in cooperation with the National University of Timor-Lorosa'e (UNTL), has established a Center for Climate Change and Biodiversity (CCCB) with the aim to undertake climate related research, providing effective data to the Government of Timor-Leste, which is targeted to develop relevant policy and to undertake data-informed decision making.
- In 2012, the NDCC established the working group for climate change adaptation which brings together relevant stakeholders from various government and non-government agencies (eg, UNDP, GIZ, Camoes, USP, World Vision, Mercy Corps, CRS, Hivos, WaterAid, Oxfam, Care International) in the area of climate change to facilitate and exchange of data and best- practices and to support the National Directorate for Climate Change in fulfilling its mandate. To reflect its broader role, the working group is currently called the Working Group on Climate Change.

Timor-Leste has also pursued policies and regulations to facilitate its response to climate change following the ratification of the UNFCCC. Some of these include:

- The Environmental Basic Law, which was approved by the Council of Minister in 2012, This law covers climate change adaptation and mitigation issues (Decree Law 26/2012).
- The Environmental License Decree Law which was approved in 2011 and includes climate change Issues (Decree Law 5/2011).
- The Operational Law of Clean Development Mechanism under the Kyoto Protocol and approval by the Council of Ministers in 2010.
- The Decree Law on Export, Import and Use of Ozone Depleting Substances (ODS) in Timor-Leste (Decree Law 3.6/2012).
- Formulation of Environmental Strategic Plan, which has to be formally approved and fully implemented.
- The Decree Law on Protected Areas (Decree Law 5/2016).
- Proposed Decree Law on Establishing a National Renewable Energy Systems based on GoTL's SDP vision of promoting renewable energy in the national energy mix and expected to be submitted this year to the Council of Ministers for approval.
- Proposed Biodiversity Decree Law, which specifically targets biodiversity conservation concerns such as the protection of habitats and ecosystems, threat and management of Invasive alien species, trade in species and the penalties, and other provisions.
- The GoTL is also in the process of drafting its Climate Change Policy in 2016.

Timor-Leste's emissions are less than 0.003% of global emissions, which is considered as one of the lowest from any Parties and negligible in the global context. Due to its geographical location, topography and socio-economic conditions, Timor Leste is placed as one of the countries at risk of disaster.⁹ The vulnerability and susceptibility of Timor-Leste is considered high, with a significant lack of coping capacity and adaptive capacity.

Timor-Leste has carried out various efforts to increase its climate resilience through technology development and implementation of adaptation measures, research, education, training, public awareness, and dissemination of information.

The institutions and regulations put in place to date provided the starting point for Timor-Leste to pursue a climate resilient development pathway. However, cooperation and assistance from the international community will be required to increase its capacity to adapt and to explore opportunities to mitigate GHG emissions whilst allowing for sustainable development. In this regard, Timor-Leste will look to leverage the support it has already received through international donor programmes to identify synergies and ways to expand and build upon existing successful programmes supporting adaptation and mitigation.

3. Mitigation

3.1 Greenhouse Gas (GHG) Emissions

According to Timor-Leste's Initial National Communication to the UNFCCC (2014), GHG emissions for the three main greenhouse gases (CO₂, CH₄ and N₂O) without land use, land use change and forestry (LULUCF) reached 1,277 Gg CO₂e. With the inclusion of LULUCF, total GHG emissions from Timor-Leste increased to about 1,483 Gg CO₂e. GHG emissions (in CO₂ equivalent) were distributed between the three gases recorded as follows: CO₂ totalled 466.87 Gg, representing 31% of the total emissions; methane (CH₄) totalled 543.56 Gg or 37% of the total emissions, and nitrous oxide (N₂O) totalled 467.18 Gg or 32% of the total emission (Figure 1). The main contributing sectors were agriculture, followed by energy, LUCF and waste.

By gases, the main contributor is CH₄ and followed by N₂O and CO₂. Total emissions from these three gases in 2010 were 548.56, 467.18 and 466.87 Gg CO₂e respectively. Contribution of CH₄ to the total emission was high as the gas is the main GHG emitted from the agriculture sector, which is the dominant source of TL's GHG emission. The contribution of this gas to the total emission of the agriculture sector was 53%.¹⁰

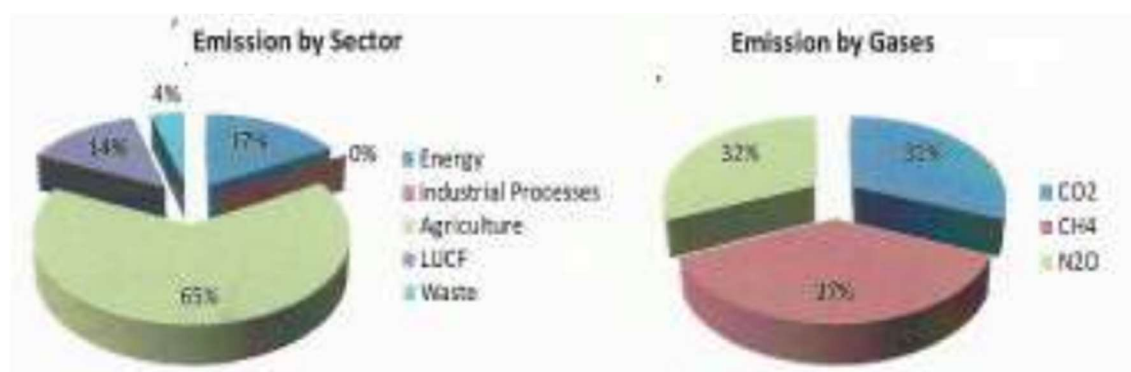


Figure 1: GHG emission estimates by sectors (left) and by gases (right) in 2010 (INC, 2014)

3.2 Sectoral Emissions & Trends

In the period of 2005-2010, the estimation results of GHG emission levels from all sectors fluctuated, particularly LUCF (Table 1) in 2006, GHG emissions the level of LUCF was the highest, Therefore, the total national GHG emission level of this year was the highest, It was recorded that deforestation was the highest in this year. For other sectors the inter-annual variation of emissions was not as high as LUCF. If the emissions from LUCF were excluded, there was an increasing trend in emission at a rate of about 2.6% per year.

Table 1: Emission trend from the four sectors and other sources (in Gg CO₂e)

Source Categories	2005	2006	2007	2008	2009	2010
Energy	200.20	207.00	313.48	261.50	222.44	250.67
Agriculture	882.69	900.66	956.86	996.75	933.01	966.27
Land-Use Change & Forestry	115.05	1,036.53	734.42	441.48	225.07	206.06
Waste	46.82	52.27	54.06	55.86	57.73	59.62
Total	1,244.76	2,196.46	2,058.82	1,755.61	1,438.25	1,482.62
Biomass utilization	704.80	727.61	750.86	774.59	798.81	823.54
International Bunker for Aviation*	2.17	1.59	3.70	4.88	5.96	5.97
GHG from oil and gas production	544.76	668.06	593.04	624.08	524.27	493.04

(Source: Initial National Communication of Timor-Leste, 2014)

GHG emissions from the combustion of natural gas for supplying energy in the oil and gas facility is the largest contributor (around 70% on average) to the overall energy sector's emissions¹¹. However, this oil and gas facility itself is a joint operation between Timor-Leste and Australia. Since there is no agreement on GHG emissions from this facility, the GHG emissions from this sub-sector was omitted from the total GHG inventory. If the GHG emissions from oil and gas subsector (from own use energy and fugitive) are excluded from the total energy sector's emission, then transportation is the largest contributor (61% in average) followed by electricity production (38% in average).

Emissions from agriculture, forest and other land uses are the main sources of GHG emissions. These are: (i) Forest and grassland conversion, (ii) Enteric fermentation, (iii) Emissions from agricultural soils, (iv) Manure management, (v) Other Emissions from LUCF, Changes in forest and other woody biomass stocks and (vi) Rice cultivation.

The agriculture sector emits major portion of Timor-Leste's GHGs. Analysis shows that in 2005, total emissions of the two main GHGs (CH₄ and N₂O) reached 882.69 Gg CO₂e, by 2010 it increased to 966.27Gg CO₂e. Methane contributed to approximately 53.4% of the total emissions, while N₂O contributed 46.6%. The subsectors are mainly enteric fermentation with 32%, followed by manure management with 27%, agriculture soil with 26% and rice cultivation with 13%.

Approximately 59% (869,130 ha) of the total land area of the country is covered by forest, out of which 312,931 ha is primary forest (20.95% of total land area), located mainly in Lautem and Covalima municipalities. Between 2003 and 2012, there has been a significant reduction in Timor-Leste's forest cover. Approximately 184,000 ha of forest (17.5% of the forest area of 2003), had been lost in that 9-year period¹². The Ministry of Agriculture and Fisheries with assistance from JICS conducted a forest and land cover survey in 2013. The survey documented a significant reduction in Timor-Leste's forest cover between 2003 and 2012, concluding that deforestation is widespread in all municipalities for dense and sparse forests, and that the reduction has been particularly high in the municipalities of Lautem, Viqueque, Bobonaro, Covalima and Manufahi. Based on an assessment of forest cover changes from 2004 to 2010, the annual loss of forest cover in Timor-Leste is approximately 14,000 ha (1.7 % per year). The total emissions resulting from land use change and forestry was 206.1 Gg CO₂ in 2010.¹³

The main sources of GHG emissions from the waste sector is Municipal Solid Waste (MSW) dumped in un-managed solid waste dumping stations (SWDS), MSW open burning, and municipal wastewater treatment. Methane (CH₄) is the main gas generated from the waste sector.

3.3 Mitigation options

The effects on human security and well-being resulting from climate change are predicted to be wide-ranging, including an increase in sea levels and a decline in crop productivity. Evidently, climate variations in Timor-Leste are already having adverse impacts on peoples' livelihoods and food security.

The Government of Timor-Leste has identified a number of potential measures for mitigating climate change for each sector.

The forestry, agriculture and energy sectors can play a significant role to mitigate climate change. Currently, about 27.4% of the total land area of the country is covered by shrubs (about 238,142 ha)¹⁴, and most of this land could be targeted for establishment of productive forest. Opportunities also exist for conservation of forests, enhancing and expanding carbon sinks, and fuel wood substitution for household cooking and lighting practices with biomass energy.

Timor-Leste is interested in exploring opportunities to undertake REDD+ activities that should be led by domestic laws and regulations, and based on the national priorities. The GoTL is willing to explore options to address the key challenges and barriers for engagement with international programmes such as the Forest Carbon Partnership Facility (FCPF) and UN-REDD Programme. The GoTL will strive to better understand requirements for participation in the UN-REDD and FCPF programmes and to assess the potential for mitigation through REDD+ activities.

For the energy sector, renewable energy such as hydropower, solar photovoltaic (PV), wind, and biomass also have potential as alternative sources of energy to reduce the use of fossil-fuel based energy production. Total renewable energy potential for Timor-Leste is 450 MW, including 352 MW from hydropower, 72 MW from wind, 22 MW from solar and 6 MW from biomass/waste sources.¹⁵

In 2014, Timor-Leste was approved for USD 1,743,000 from the GEF, for a mitigation project titled 'Promoting Sustainable Bio-energy Production from Biomass', currently being implemented by UNDP, the Ministry of Public Works, Transportation and Communication and the Ministry of Commerce, Industry and Environment. The project envisions removal of barriers to the sustainable production and utilisation of biomass resources and application of biomass energy technologies to support local economic, environmental and social development. This will also lead to GHG mitigation through substitution of conventional energy by renewable energy sources.

For off-grid rural electricity, the GoTL is promoting solar home systems and approximately 11 % of households (205,361 households in total) currently have access to solar home systems installed primarily by the Government of Timor-Leste.

Timor-Leste is also in the process of drafting a Renewable Energy Decree Law to establish a national renewable energy system and a Renewable Energy Plan.

In Timor-Leste, 95% of households use firewood for cooking and 83% households cook over open fire¹⁶. MCIE through the Directorate General for Environment has signed a MoU on the 5th of July 2016 with Mercy Corps on the promotion of clean cookstoves in Timor-Leste. The use of firewood and inefficient traditional stoves are posing serious public health, socio-economic and environmental consequences for the people of Timor-Leste. Currently, the GoTL-UNDP-GEF supported "promoting sustainable bio-energy production from biomass project, targeting 20,000 households to use improved energy efficient cookstoves, which is estimated to cover approximately 10% of the Timorese population, The project will also

promote industrial stoves (eg, for bakeries, restaurants) and Institutional stoves (eg, for schools),

On the demand side, conservation measures in the industrial, transportation and residential sectors are identified. Through the deployment of appropriate technologies and increased energy efficiency measures, notable reductions in GHG emissions can be realised.

Table 2 below outlines the potential mitigation actions for Timor-Leste, the actions taken to date and areas that could be explored further. Although GHG emission from waste is not a key source, there are potential mitigation actions of this sector such as listed in the table below.

Further details of the specific activities and the milestones are contained in Timor-Leste's Initial National Communication.

Table 2: *Potential Mitigation Options*

Sector	Potential Mitigation Options
Energy	
Renewable and low carbon Energy	Achieve higher efficiency and less carbon emissions from power generation through the use of (pico/micro-hydro), biomass, biogas, solar PV, wind power at different scales, natural gas power generation, etc. Reducing dependency on imported fuel.
Rural Electrification	Enhancing rural electrification using renewable energy to supply energy in rural communities.
Energy Efficient Cookstoves	Reduce dependency on fossil fuels for cooking. Reduce the average amount of fuel-wood used for cooking in private households, and thereby deforestation) by introducing fuel substitution and supporting the use of energy-efficient cookstoves.
Energy Efficiency	To promote the use of higher energy efficiency technologies in end users (efficient lamps, efficient electric motors, building codes and efficient energy systems).
Energy efficiency in transportation sector	Continue to promote and implement the current Decree Law (No.30/2011) on used vehicles which are imported into Timor-Leste to be less than 5 years of factory production.
Public transport	Promote use of public transport by enabling convenient (routes to all areas) and reliable access to bus or micro-bus, constructing appropriate facilities such as proper bus stops, terminals, and establish necessary regulations to control the transportation system.
Agriculture	
Livestock management	Promotion of Biogas and composting for reduction of agricultural emissions.
Sustainable agriculture	Reducing slash and burn practices by Introducing permanent agriculture with improved management practices and sustainable, climate-smart agricultural technologies and processes.
Forestry	

Sector	Potential Mitigation Options
Rehabilitation of degraded lands	Sustainable forest management and land degradation neutrality.
Customary Forestry	Promotion of customary forestry practices like "Tara Bandu" and better management of forestry resources through natural regeneration.
Mangrove plantations	Enhancing coastal resilience and exploring carbon sequestration in mangroves,
REDD+	Explore opportunities to participate in international REDD+ programmes.
Protected Areas	Sustainable management of 44 Protected Areas of Timor-Leste.
Afforestation and reforestation	One million trees are expected to be planted every year based on National Strategic Plan.
Waste	
Managed landfills and landfill gas	Reducing unspecified treatment of MSW by increasing the amount of MSW brought to the landfill will increase GHG emission from 5WDS, therefore this action must be supported by development of managed landfill equipped with LEG (landfill gas) recovery system for flaring or utilization.
Composting resource recovery and recycling	Reducing open burning through composting and applying 3R will significantly decrease GHG emissions from open burning.
Improved incineration technology	Improving technology of old Incinerators (for clinical waste from the hospital) will increase combustion efficiency and therefore GHG emissions from the waste sector can be reduced.
Hydrochlorofluorocarbon Phase-out Management Plan (HPMP)	Timor-Leste is part of the Vienna Convention on the Protection of the Ozone Layer. It also ratified the Montreal Protocol on Substances that Deplete the Ozone Layer. Timor Leste is in the process of phasing out HCFCs and replacing this with low GWP HFCs. By 2030, 7.5 MT of HCFC-22 (13.6 Gg CO ₂ e) currently in existence in TL will be phased out.

As it prepares its Second National Communication (SNC) Timor-Leste will be better placed to determine the emissions reduction potential of these actions, based on more accurate and current data for the period of 2012-2017. Timor-Leste, based on the SNC, will strengthen its GHG data collection and monitoring system. This data will be important to allow Timor-Leste to assess the opportunities to undertake the potential actions identified above and to limit or reduce emissions in these sectors.

Working in a manner that is complimentary to the SNC process, and with further support if required, Timor-Leste plans to carry out further research to:

- Assess the feasibility of the potential actions identified;
- Quantify the costs associated with each of the potential actions;
- Identify barriers to effective implementation of the potential actions and the steps needed to address those barriers;
- Determine which actions are able to be carried out by the Government of Timor-Leste without support and which will require international support;
- Develop a plan to prioritise and progress these potential actions.

4. Adaptation

The Lima Decision explicitly gives a great deal of flexibility to Parties that wish to communicate about adaptation. In addition to inviting them to consider including an adaptation component in their INDC, it invites them to consider communicating their undertakings in adaptation planning without regard to vehicle or format. The overall rationale of INDCs is anchored in Decisions (1/CP.19, para, 2 (b) and 1/CP.20 paras 12 to 14. It allows Timor-Leste an opportunity to:

- Raise the profile of adaptation planning, action, and needs at the national level;
- Articulate a long-term vision of nationally appropriate climate-resilient development;
- Gain international recognition for existing national actions and investments on adaptation and progress towards achieving the long-term vision;
- Build on the momentum from the NAPA process and assist in the implementation of the key priorities;
- Describe support (information, capacity, technology, and financial) needs for completion and implementation of activities; and
- Share lessons learned and address shared challenges.

Timor-Leste's climate is affected by the West Pacific Monsoon, which is driven by large differences in temperature between the land and the ocean. It moves north to mainland Asia during the Southern Hemisphere winter and south to Australia in the Southern Hemisphere summer. Its seasonal arrival usually brings a switch from very dry to very wet conditions. The normal south-easterly-trade winds in Dili are replaced by westerly winds from the monsoon onset until the end of the monsoon season.

According to projections, Timor-Leste's future climate can be summarized as follows:

- Temperatures will increase by 0.4-1.0 degree Celsius by 2030;
- Rise in number of hot days and warm nights;
- Decrease in dry season rainfall and increase in wet season rainfall;
- Extreme rainfall days likely to occur more often;
- Decrease in frequency of tropical cyclones, but likely increase in intensity of cyclones;
- Increase in sea-level rise; and
- Increase in ocean acidification.

4.1 Vulnerability

Timor-Leste is extremely vulnerable to the impacts of climate change. Many sectors are seriously affected by extreme climate events. Data from the last 10 years shows that climate-related hazards such as floods, droughts, storms, landslides and wildfires have caused major loss of human lives and livelihoods, the destruction of economic and social infrastructures, as well as environmental damages.

The country is located in a region particularly sensitive to the unpredictable impacts of El Niño and climate change. In 2015-15 El Niño event, 120,000 people¹⁷ in five most affected municipalities (Covalima, Lautem, Viqueque, Baucau) and ZEESM Oecusse faced major problems related to water shortage, food security, health and livelihoods. The GoTL commissioned an emergency response involving 10 ministries which was coordinated by the Ministry of Interior. According to the assessment of the Ministry of Agriculture and Fisheries, households faced food insecurity increased from 40.6% to 45.9% in these most affected areas.¹⁸ In terms of climate change, warmer temperatures are likely to increase the incidence of vector-borne diseases such as malaria and dengue fever. Rainfall is also expected to increase in intensity, which may exacerbate soil erosion, landslides and local flooding. Changes in rainfall patterns may impact agricultural productivity and water availability. Sea-level rise may also increase coastal erosion and destruction of infrastructure - particularly in Dili; and salinization of water sources for both drinking and agricultural production.¹⁹

One third of land in Timor-Leste is at high risk of erosion, and approximately half is at risk of degradation and fertility decline. Due to wide spread degradation, natural water storage in upper catchments is reduced, jeopardizing downstream water supplies. Landslides and serious downstream flooding are common occurrences, damaging land, infrastructure and inshore marine ecosystems²⁰. Establishing a hydrological network and ground water monitoring systems based on national plans will help to reduce vulnerability by increasing water security. Water supply in Timor-Leste is governed by the Decree Law on Water Supply (No. 1/2004 & 4/2004) and GoTL is in the final stages of drafting the Water Resources Management Policy and Decree Law.

Based on Timor Leste's Initial National Communication 2014, 44.7% of the sucos (villages) in Timor-Leste could be categorized as quite vulnerable to the impacts of climate change, 2.9 % vulnerable and 11.5 % very vulnerable. Thus only 18.6% sucos were less or not vulnerable. The vulnerable sucos are mostly located in the western part of the country²¹. The impact of climate change is expected to be high in the vulnerable sucos and therefore, these sucos should be the highest priority for the implementation of adaptation actions. Improving the capacity of the sucos to manage climate risk in key sectors such as agriculture and water is very important as part of the effort to reduce their vulnerability. Losses in agricultural production due to climate change will increase poverty within the sucos and this in turn will contribute to an increase in their vulnerability. Therefore, assessment of climate change impacts on key sectors is crucial to assist in identifying adaptation options.

Based on the trends of sea level obtained from satellite altimetry data (referred to as multi-mission), there were increasing trends of sea level rise surrounding Timor-Leste. The rate of SLR was found to be higher in the south coast (≥ 5.5 mm/year) than in the north (< 5.5 mm/year) as reported in the initial National Communication, 2014. On average, the rate of sea level rise surrounding the main island of the country based on multi-mission satellite altimetry is around 5.5 mm/year. Assuming that this rate is linearly consistent to the future (2010-2100), the sea level in the region is projected to increase around 50 mm by 2100.²²

4.2 Adaptation Measures

The 'Dii Declaration on Climate Change Adaptation' recognized *the strong interdependence of Climate Change Adaptation and the development targets of Timor-Leste as outlined in the strategic development plan. We believe that the government's priorities for the people of Timor-Leste can only be sustainably achieved when we consider effective Climate Change Adaptation a pre-condition. Hence, we commit to the mainstreaming of climate change adaptation in the action plans in all sectors to work jointly towards the targets outlined in the national policies. We reiterate the commitments to all International declarations signed by Timor-Leste regarding sustainable development and climate change, including internationally agreed development goals.*

Adaptation measures need to focus on reducing the adverse effects of climate change, promote sustainable development and reduce poverty. These measures should build on existing strategies and plans across all sectors within Timor-Leste including the National Priorities process. Priority adaptation measures²³ proposed by Timor-Leste in the key sectors are:

4.2.1 Food Security: Reduce vulnerability of farmers and pastoralists to increased drought and flood events by improving their capacity to plan for and respond to future climatic conditions and improve national food production:

- Develop integrated agroforestry and watershed management including climate change dimensions.

- Based on existing national action plans on sustainable land management, implement Integrated, sustainable land management promoting fixed/permanent agriculture, reduced burning, reduced erosion, and increased soil fertility.
- Reforestation of degraded land to prevent landslides and provide a sustainable fuel wood source in priority areas with high vulnerability to climate-related risks.
- Improve physical infrastructure/civil engineering and natural vegetation methods to prevent landslides in hill sites, roads and river banks.
- Education and awareness and conduct a pilot demonstration on sustainable agriculture and forest management that increases resilience and reduces climate related impacts of shifting cultivation and unsustainable upland farming practices.

4.2.2 Water Resources: Promote integrated Water Resource Management (IWRM)

- Build climate proofed and environmentally sustainable infrastructure to protect water sources (springs, streams, wells, etc.) in order to provide safe water access for food production, sanitary uses, ecosystems and industry development, and water supplies during climate change extreme event periods.
- Enhance government and community strategies to respond to drought exacerbated by climate change.
- Create and enhance water harvesting model (capture and storage), water distribution system and management system at all levels to avoid water shortages due to climate change.
- Control of quantity of water use by industry, and water pollution control standardization including coffee processing waste management in a climate change context,

4.2.3 Human Health: Enhance capacity of the health sector to anticipate and respond to changes in distribution of endemic and epidemic climate sensitive diseases, and reduce vulnerability of the population to infection in areas at risk from expansion of climate-related diseases²⁴:

- Establish an integrated disease surveillance, response and early warning system within the health system reaching to the community level.
- Mainstreaming and implementation of climate change issues into the newly established Comprehensive Primary Health Care system which includes Family Health and SISCA (Integrated Community Health Services).
- Promote evidence based decision making, health policy formulation and program design, taking into consideration of climate change and its adverse effects on diseases, particularly water, air and vector borne diseases such as Malaria and Dengue
- Review of all existing guidelines, Standard Operating Procedures (SOPs), considering climate change and its adverse effects.
- Establish health cluster in order to prepare and response for any emergency events and disasters.

4.2.4 Natural Disasters Improve institutional and staff capacity in the disaster sector in relation to climate change Induced disasters:

- Establish early warning systems in areas identified as vulnerable to disasters such as floods and storms.
- Integrate of climate risk information into traditional disaster risk reduction and management,

4.2.5 Forests, Biodiversity and Coastal Ecosystems Resilience:

- Maintain mangrove plantations and promote awareness raising to protect coastal ecosystems from impacts of sea level rise.

- Include ecosystem management in national planning to develop sustainable, ongoing programme, nurseries and community awareness development – 1st year assessment, 2nd year plan, 3rd year implementation and maintenance.
- Mangrove plantation and protection to enhance coastal resilience.

4.2.6 Livestock Production:

- Improve planning and legal framework for promoting sustainable and balanced food for livestock production under increased climate variability and climate change conditions.

4.2.7 Physical Infrastructure: Improve regulations and standards for climate-resilient infrastructure:

- Review existing laws, regulations and standards to enhance CC-resilience of critical infrastructure.
- Pass new legislation to strengthen and guarantee national development through improved regulation, quality of materials, adapted building codes and practices and law enforcement.
- Construction of sea walls in the vulnerable coastal areas to protect from sea level rise.

4.2.8 Oil and Gas Productions Strengthen and protect valuable offshore oil and gas infrastructure against climate change impacts.

- Protect offshore Infrastructure against strong wave damage that impacts the distribution of gas and oil, and reduce accidents and destruction of offshore oil and gas infrastructure; including: i) early warning system equipment; ii) data information to show occurrences; iii) equipment protection.

4.2.9 National Institutional Capacity Development for Climate Change:

- Strengthen the mandate of the cross-sectoral national climate change team to improve coordination and engagement.
- Establish a Climate Change Unit with necessary staffing and budget to engage in and support national policy development and programming activities,
- Capacity development support for key non-governmental Institutions in low emissions and climate resilient development planning, including national NGOs and research/educational institutions.
- Develop a national climate change strategy and action plan.
- Promote sub-national capacity development for improved adaptation planning and implementation,
- Strengthen national hydro-meteorological department to collect, compile, analyze and disseminate climate-related data.

Taken collectively, these activities provide a coherent programme which, if implemented as an integrated programme, would significantly reduce the vulnerability of Timor-Leste's critical development sectors to climate-related risks.

5. Loss and Damage

This is a vital issue for Timor-Leste which it would like to actively pursue as part of the mandate for a review of the structure and plans at COP22. It would also like to enhance understanding, actions and support or, areas including comprehensive risk assessment and management; risk insurance and risk transfer; rehabilitation; early warning systems; emergency preparedness; slow onset events; risk insurance facilities like crop insurance; events involving permanent end

irreversible loss and damage; non-economic losses; and resilience of communities, livelihoods and ecosystems.

6. Implementation of the INDC

6.1 Planning process for Producing the INDC

Timor-Leste adopted an all-inclusive process of engaging relevant stakeholders through bilateral consultations and workshops. The post COP21 Dialogue held in Dili provided much needed awareness about INDCs and the provision of additional data and information. It strengthened the whole-of-government approach by providing national ownership of the INDC, as well as helped realise the synergies between other processes, including Initial National Communication, National Adaptation Programme of Action²⁵ (2010), Strategic Plan for the Ministry of Finance (2011-2030), Rural Energy Policy (2008), National Strategic Development Plan (2011-2030) and other externally funded development projects in related areas.

A national stakeholder consultation was held to solicit inputs of data and other relevant Information based on an initial draft of the INDC that was circulated earlier. This consultation included representation from a wide range of stakeholders, including government, non-governmental, private sector and development partner representatives. Key informant Interviews were conducted with relevant key stakeholders to collect and validate relevant data and sources.

The national workshop was followed by two more focus group consultations with relevant stakeholders from different GoTL ministries and directorates, organised in conjunction with the National Directorate of Climate Change, the national Climate Change Working Group and UNDP to review and finalize the INDC draft.

7. Means of Implementation

“The most vulnerable are those with limited financial, technological and human capacities to adapt to the impacts of climate change. This leads to Food insecurity, famine, destruction of infrastructure, human displacement and further poverty in developing countries, especially in the “Least Developed Countries”, with limited capacity on adaptation, H. E. J. Ramos-Horta, former Head of State, The Special Envoy of the President of Timor-Leste, 1996 Nobel Peace Prize Laureate²⁶.

As an LDC, the ability of Timor Leste to pursue the proposed adaptation and mitigation actions identified in this INDC will be dependent upon the receipt of technology transfer, finance and capacity building support. As Identified throughout this document, Timor-Leste is already undertaking programmes with the support of multilateral development banks, international agencies and developed countries. This is welcomed. However, further support will be required for meaningful implementation.

7.1 Financial

Lack of funds is the main obstacle to development and implementation of actions that may assist in climate change mitigation and adaptation. The funding issue is also major impediment to national research and development efforts, as well as to building human and institutional capacity.

Timor-Leste will need international financial assistance for adaptation and mitigation actions that is predictable and sustained for the duration of the programmes Timor-Leste welcomes the ability to access finance through the Green Climate Fund (GCF), and has already started working with the GCF on implementing its readiness proposal and the development of pipeline

of projects. Timor-Leste looks forward to streamlined modalities of the global climate change funds including the GCF to facilitate efficient access of funds for its adaptation and mitigation efforts. It will pursue efforts to get accreditation as National Implementing Entity while working with international accredited entities to develop relevant projects for the GCF pipeline, as well as through the GEF funding windows under the Adaptation Fund (AF) and Least Developed Countries Fund (LDCF).

The GOTL would work with development partners and multilateral agencies to ensure inclusive development based on its identified priorities, and aims to promote coherence and greater coordination amongst donors for greater effectiveness of implementation. The issue of climate change is a development challenge for Timor-Leste and cuts across all the SDGs, the implementation of which would be a key priority for the country in coming years, Timor-Leste will emphasize country ownership of these climate resilient development interventions using country processes that are led by the country.

Additional funding must be allocated at a scale sufficient to meet the significant gap between what is needed and the level of funding already pledged by development partners during negotiations under the UN Framework Convention on Climate Change (UNFCCC). Funding needs to be tracked and reported on transparently. Small Island Developing States (SIDS) including Timor-Leste must be assisted with readiness support to build capacity, implement climate plans and strengthen climate finance management. Access to the complex array of climate finance mechanisms must be simplified. SIDS communities must receive direct support to be actively engaged in building climate resilience.

If Timor-Leste chooses to ratify the Paris Agreement, it will be able to access funds through the Green Climate Fund (GCF)

Technological

A preliminary survey of Environmentally Sound Technology (EST) and the status of Research and Systematic Observation was carried out as part of the preparation of the Initial National Communication in 2013. According to that survey, the technologies that have been implemented to date in Timor-Leste include biogas, organic agriculture, efficient cook stoves, agro-forestry and rainfall harvesting. Technologies on organic agriculture, agroforestry, rainfall harvesting, recycling of agricultural waste, biogas, efficient cookstoves and water conservation were perceived as being the most important technologies for further development²⁷ (INC, 2014). Renewable energy is also viewed as an area for further development.

7.2 Capacity Building

Institutional and capacity development for staff and community should be continuously assessed, challenged and improved to make the greatest impact on the country by assisting all stakeholders. A combination of a variety of mechanisms, from various data collections and verification workshops to informal brainstorming with stakeholders should be utilized for this purpose.

Capacity development is a long term process. A single development agency cannot provide comprehensive support, and concerted efforts by the government and the international community are therefore crucial. The three pillar model, which addresses skills and knowledge, systems and processes, and attitudes and behaviours, could be used as a starting point to develop a comprehensive institutional capacity development plan

Some of the specific measures as part of the National Institutional Capacity Development for Climate Change include:

- Strengthening the mandate of the cross-sectoral national climate change team to improve coordination and engagement,
- Capacity development support for key non-governmental institutions in low emissions and climate resilient development planning, including national NGOs and research/educational institutions,
- Development of a national climate change strategy and action plan.
- Promotion of sub-national capacity development for Improved adaptation planning and implementation.
- Strengthening national hydro-meteorological department to collect, compile, analyze and disseminate climate-related data.

7.3 Fair and Ambitious

The Republic of Timor-Leste is a small contributor to the greenhouse gas emissions by any measurable indicator and yet it is at the frontline of the wrath of climate change and sea level rise. It has a right to develop its economy and improve the well-being of its population. Limiting the global temperature to below 2°C relative to preindustrial levels, and pursue efforts to limit it below 1.5°C provides a moral Imperative for Timor-Leste. The government has embarked on a number of actions which will result in increasing the use of renewable energy technologies, improve energy security and reduction of GHG emissions. However, the main focus for long term sustainable development still remains adaptation to climate change by addressing the adverse impacts of climate change Timor-Leste has been at the forefront of responding to climate change as a Party to the UNFCCC through actions taken at the national level, as outlined in section 2.2.

8. Conclusion

Timor-Leste is already experiencing the adverse effects of climate change and recognizes that it will seriously undermine efforts towards resilience building, sustainable development and eradicating poverty.

Climate change is a cross-cutting development issue as it affects every aspect of the Timorese way of life and livelihoods Climate change impacts exacerbate existing cultural and socio-economic vulnerabilities. These impacts threaten the sustainable development of the nation. To this end, the people of Timor-Leste must collectively build and strengthen the nation's resilience to combat climate change, However, this cannot be done alone and in isolation; regional and global cooperation is imperative to put the country on a pathway to climate change resilience and sustainable development

Timor-Leste's vulnerabilities studies and modelling of future climate demonstrates that the scientific underpinnings of the discussions on climate change are clear in defining impact thresholds. Therefore, international cooperation and support is required to assist it pursue a sustainable development pathway.

Timor-Leste continues to revise its policies in energy and climate change sectors in line with its sustainable development as contained in the Strategic Development Plan. The significant costs of imported fossil fuels are a major factor in its balance of payments. Whilst Timor-Leste continues to take actions to reduce its fossil fuel import bill, thereby reducing its carbon footprint, it will underscore the need for support to assist in its ambition for transforming the energy sector to low-carbon sources through greater use of renewables such as solar and wind and use of transformational technology.

Timor-Leste's INDC makes no attempt to set a target for reducing emissions. This is deliberate as Timor-Leste does not feel that as a LDC, its target serves any meaningful purpose in the overall context of global emissions Notwithstanding this Timor-Leste has already undertaken

thorough renewable energy programs to provide alternative energy sources such as solar home lighting systems to primarily rural population. Moreover, through programs such as efficient cookstoves, it will have significant impact on the use of biomass resources and forest/land degradation sectors. There are many opportunities to push through other measures such as conservation, education and energy efficiency and other measures, recognizing its extreme vulnerability to the impacts of fossil fuel prices.

International support is crucially important to enable Timor-Leste implement further actions enshrined in its policies and plans, in both mitigation and adaptation, at sectoral levels. For example, the growing emissions in the transport sector, as evidenced from the increased numbers of vehicles on land and vessels for sea transport, needs to be addressed through technological innovations like replacement of ODS alternatives through energy efficient, low polluting and warming potential substances in air-conditioning and refrigeration.

This INDC will be a strong basis for Timor-Leste's NDC envisaged under the Paris Agreement. Full and thorough consultations with all stakeholders and within Government will be undertaken prior to ratification of the Paris Agreement.

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