



REPÚBLICA DEMOCRÁTICA DE TIMOR LESTE
Ministry of Public Works

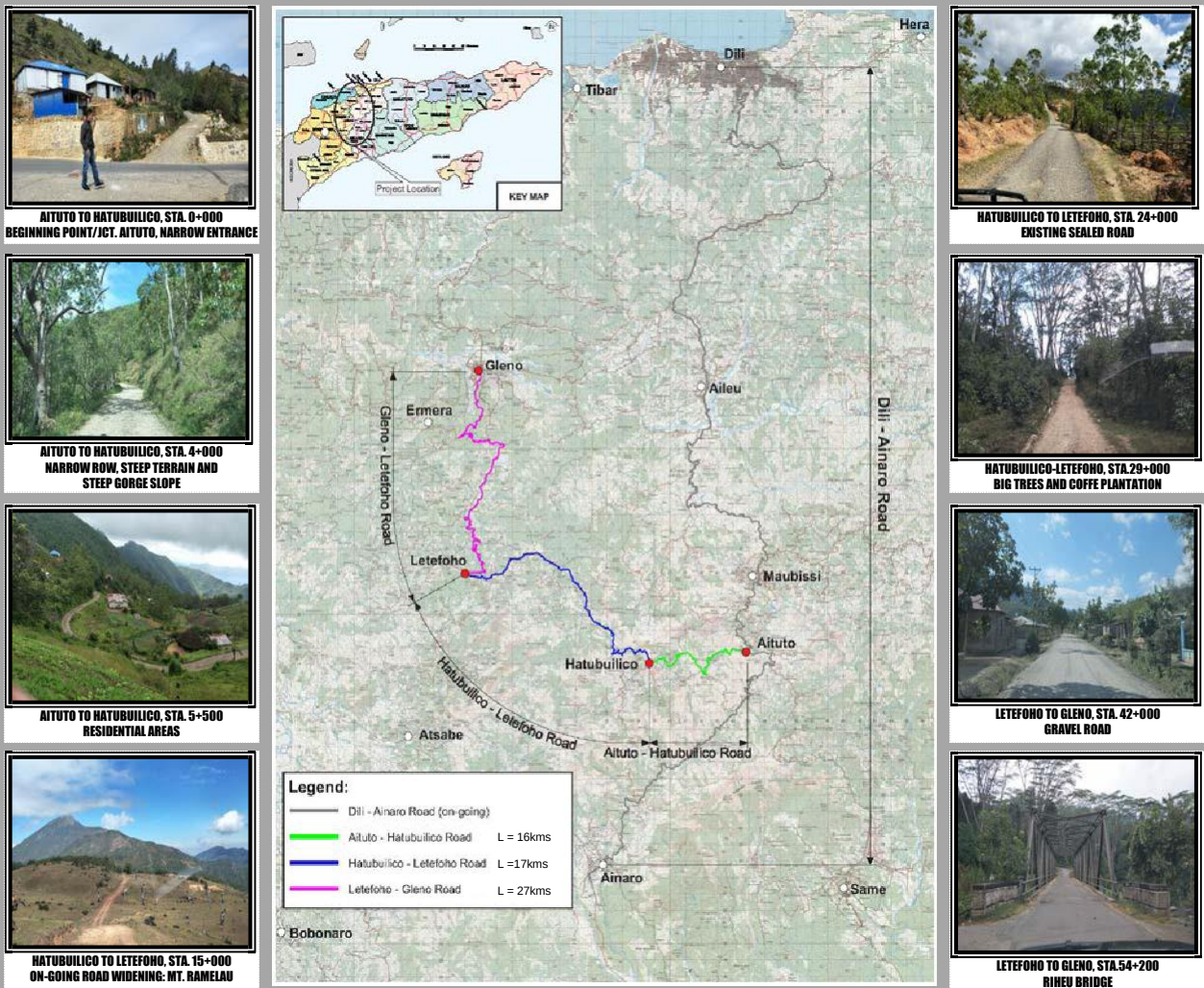


TIMOR-LESTE ROAD CLIMATE RESILIENCE PROJECT (TLRCRP)
RFP No.: RFP/021/MOPTC-2017

**BRANCH ROAD SECTION OF THE DILI - AINARO ROAD NAMELY,
AITUTO - HATUBUILICO - LETEFOHO - GLENO**

**Simplified Environmental Impact Statement
Environmental & Social Impact Assessment**

May 2019



April 2019

**Simplified Environmental and Social Impact
Statement (SEIS)/
Environmental and Social Impact
Assessment (ESIA)**

**Branch Road Section of Dili – Ainaro Road
(Aituto – Hatubuilico – Letefoho – Gleno)**

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ABBREVIATIONS and ACRONYMS

a.s.l.	–	above sea level
CESMP	–	Construction Environmental and Social Management Plan
CITES	–	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEIA	–	Department of Environmental Impact Assessment (in NDE)
DRBFC	–	Directorate of Roads, Bridges and Flood Control
EA	–	Executing Agency
EDTL	–	<i>Electricidade de Timor Leste</i>
EHS	–	Environmental Health & Safety Guidelines (of World Bank Group)
EIS	–	Environmental Impact Statement
ELL	–	Environmental Licensing Law (Decree No. 5/11)
ESIA		Environmental and Social Impact Assessment
ESMP	–	Environmental and Social Management Plan
GBV	–	Gender-based Violence
HSEO	–	Health, Safety and Environment Officer (Contractor)
EO	–	Environment officer (in PMU)
GRC	–	Grievance Redress Committee
GRM	–	Grievance Redress Mechanism
GoTL	–	The government of Democratic Republic of Timor-Leste
IA	–	Implementing Agency
ICCAI	–	International Climate Change Adaptation Initiative
IEE	–	Initial Environmental Examination
IUCN	–	International Union for Conservation of Nature
KEI	–	Katahira Engineering International
MAFF	–	Ministry of Agriculture Fisheries and Forestry
MOF	–	Ministry of Finance
MPW	–	Ministry of Public Work
NGO	–	Non – Government Organization
PISC	–	Project Implementation and Supervision Consultant
PMU	–	Project Management Unit in MPW
ROW	–	Right-Of-Way
RP	–	Resettlement Plan
SEA	–	Sexual Exploitation and Abuse
SEIS	–	Simplified Environmental and Social Impact Statement
TA	–	Technical Assistance
UNTAET	–	United Nations Transitional Administration for East Timor
WB	–	The World Bank

1. Executive Summary

1.1 Overview

1. The Timor-Leste Road Climate Resilience Project (TLRCRP), financed by the World Bank is provided for emergency repairs and upgrading of the high priority road sections which supports climate resilience of 110 kilometers (km) Dili – Ainaro Road, and serves as a key link between the north and the south of the country.
2. The road segments linked to the Dili – Ainaro road will be upgraded to further realize the benefits. The branch roads need to be improved is *Aituto – Hatubuilico – Letefoho – Gleno* road section for about sixty (60) kilometers length. The status of partly section of branch roads ($\pm$ 30 Km) currently is municipal road and will be upgraded to Timor Leste National Road standard i.e. 6 meters asphalt surface with two lines, and one-meter shoulder on both sides of the roads.
3. The initial design of Branch Roads *Aituto – Hatubuilico – Letefoho – Gleno* divided into 3 sections; the existing carriageway of 1st Section and 2nd will be rehabilitated or resurfaced, meanwhile, Section 3 will be improved and widened to bring it up to the National Road standard. The Project will be completed by (i) pavement reconstruction with selective widening if required;(ii) improvement of drainage structures to meet forecasted rainfall volumes and intensities; (iii) clearing and improvement of culverts; (iv) construction of reinforcement of slope stabilization structures; and v) introducing road marking and signage to improve road safety.
4. The 3rd alternative has considered as Feasibility Study result, hence upgrading to National Road Standard with appropriate drainage, slope stabilization, limited widening for road safety purpose, and including effective maintenance was considered the most appropriate option to be applied for all sections. Subsequently, Detailed Engineering Design was made on this basis.
5. The Project Proponent is the Government of Timor-Leste (GoTL) and the implementing agency is the Ministry of Public Works (MPW). The Project Management Unit (PMU) is established within MPW to manage and implement projects financed wholly or partially by GoTL's development partners. The PMU will responsible for day to day management of the Project, including implementation of requisite safeguards measures.
6. The screening, assessment, and management/mitigation implementation of environmental and social impacts of the Project will be governed by laws, regulations, and standards for environmental assessment and management of GoTL. The Basic Law of Environment (April 2012) covers all relevant aspects of environmental protection and the Decree-Law 5/11 covers requirements for applying environmental license and environmental assessment. In addition to GoTL's requirements, the Project must comply with WB's Operational Policy (OP) 4.01 Environmental Assessment, OP 4.04 Natural Habitats, OP 4.10 Indigenous Peoples, OP 4.11 Physical Natural Resources and OP 4.12 Involuntary Resettlement.
7. In accordance with Timor-Leste's law (DL 5/211, Annex II), the Project was screened as Category B based on the classification that rehabilitation of an existing road, in all scale, defined as Category B Project. The Project consists of improvement and rehabilitation activities which potential adverse environmental impacts are site-specific, hence mitigation measures can be designed readily. There is likelihood that slope cutting and backfilling may alter the landscape of the area. Efforts to reduce such impacts have been considered through engineering design such as designating specific soil disposal sites, installation of retaining walls and replanting to reduce erosion. The project category based on OP 4.01 Environmental Assessment will be subject to World Bank's appraisal.
8. Following the requirements of GoTL, this Simplified Environmental Impact Statement (SEIS) has been prepared for the Project for the purpose of obtaining environmental permits. The SEIS also serves as an Environmental and Social Impact Assessment

(ESIA), which is a requirement under the World Bank's Operational Policies.

9. Climate change may impact the road through increased rainfall; the climate change resilience measures proposed to integrate both civil-engineering and bio-engineering solutions and increased maintenance to reduce the risk of damage to the road infrastructure.
10. A series of public consultations at the village/*Suco* levels was undertaken as part of the SEIS/ESIA process. Prior to these consultations, information about project activities was disseminated to potentially impacted communities along the Branch Road corridor through *Suco* leaders and information boards as well as the general public and authorities through district meetings and survey assessments. A complete record of these consultations can be found in Appendix 5.
11. Information was provided on the scale and scope of the Project works and the expected impacts and the proposed mitigation measures. The process also gathered information on relevant concerns of the local community, and feedback was incorporated into the Environmental Management Plan to address the issues. Project documentation will be disclosed in a place and language accessible to stakeholders.
12. The project's Grievance Redress Mechanism (GRM) procedures will be established to support resolve issues associated with the Project. The aim of GRM is to provide an accessible, timebound and transparent mechanism for the affected persons to voice and resolve social and environmental concerns linked to the Project. Resolution of these issues and concerns will be undertaken expeditiously and according to the procedures of the GRM. The complaints registry maintained at the site Project office and by the contractor will be subject to monitoring. The GRM is based on the mechanism established by PMU for other projects and which is currently working well.
13. A Grievance Redress Mechanism will be provided for all PMU workers and contracted workers by each contractor selected. This mechanism is expected these workers to raise workplace concerns. Such workers will be informed of the GRM available to them at the time of recruitment and the measures put in place to protect them against any reprisal for its use. Measures will be put in place to make the mechanism easily accessible to all such project workers. Mitigation measures and environmental monitoring are required to minimize the environmental impacts in the design, construction, and operational phases. The main issues are related to planning and design of the Project such as structures and roadside drainage, control of construction impacts such as spoil and waste disposal, water quality impacts, health and safety concerns, tree felling, traffic interruption, re-provisioning of electrical and utilities, noise and dust during construction.
14. The PMU shall update the Environmental and Social Management Plan (ESMP) based on Detailed Engineering Design (DED) and integrate it into the bid and contract documentation, to ensure these impacts are mitigated to the greatest extent feasible. The contractor will prepare a site- specific Construction ESMP (CESMP) and elaborate on how they propose to implement the works. The CESMP will include the contractor's method statements and proposed actions to cover: waste management and spoil disposal; tree removal and replanting; utilities, electrical re-provisioning; drainage; construction materials management; runoff control, landslide and excavation protection (erosion and sediment control); noise and dust control; traffic management and road safety; including occupational health and safety.
15. The Project will provide an expanded national road network, more efficient travel, and improved traffic flow through the improved vertical and horizontal alignment. The impacts from construction and operation will be avoided through technical design and mitigation measures; hence it is predicted that there will be no insurmountable impacts. Subsequently, ensure that the ESMP is included in the contract documents and implemented thoroughly. In the event that any design details change the locations or scope of the proposed Project works the environmental and social assessment and ESMP shall be reviewed and revised accordingly. The findings of the SEIS/ESIA are that the

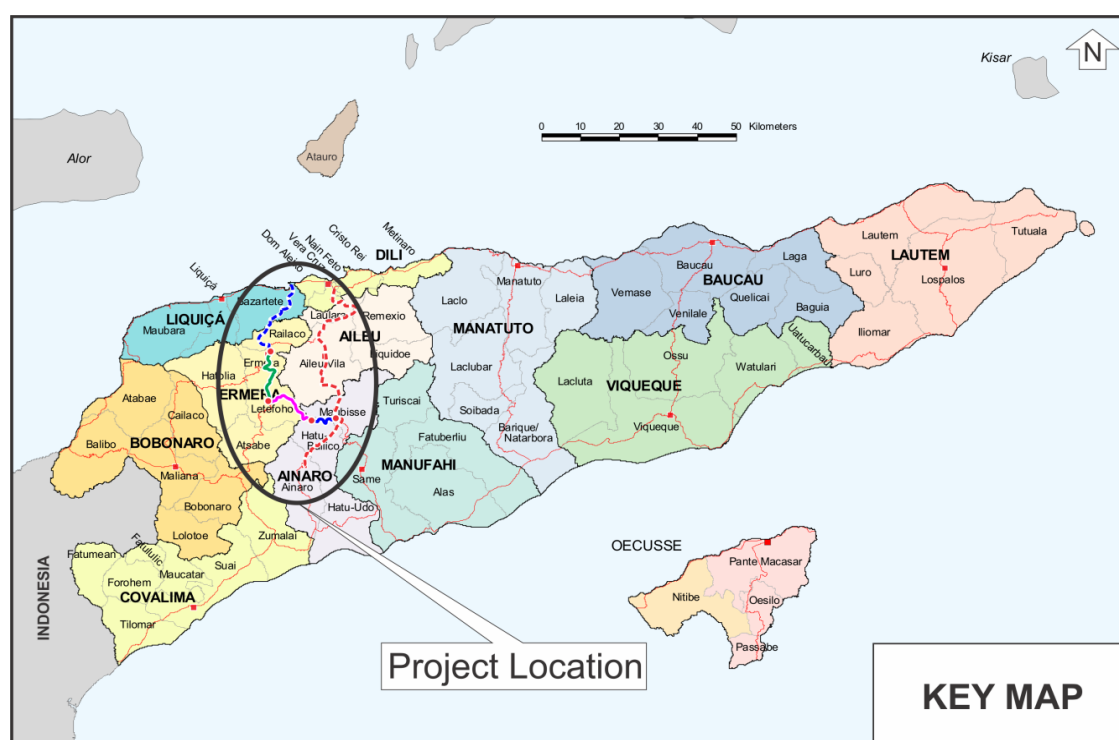
environmental and social impacts of the proposed rehabilitation of the Aituto – Hatubuilico – Letefoho – Gleno will be manageable if the mitigation measures established in the ESMP are implemented thoroughly. The SEIS/ESIA also sets out the requirements for monitoring.

16. This SEIS/ESIA covers all sections 1-3, however the planned investments under the Bank's funded Timor Leste Branch Roads Project will only cover Section 2 and 3. There will also be other activities under this project for the road safety improvements, institutional strengthening (technical assistance) and project management. The safeguard instruments for these activities are described in more detail in the ESMP.

1.2 Introduction

17. The on-going World Bank's Timor-Leste Road Climate Resilience Project is financing emergency repairs and upgrading of the high priority road sections totaling up to 110 km between the capital of Dili to Ainaro. This road serves as a key link between the North and the South of the Timor-Leste.
18. This SEIS/SESA covers the proposed additional sections, called the Branch Road connecting Aituto and Hatubuilico Administrative Post of Ainaro Municipality and Letefoho Administrative Post and Gleno in Ermera Municipality. The project will improve and upgrade the Aituto – Hatubuilico – Letefoho – Gleno links, which are divided into 3 sections of about 60 Km in length. The existing carriageway will be improved, widened and upgraded to bring it up to the National Road standard. The minimum requirement of the Right of Way (ROW) for the Branch Road is on average 9 meters (6-meter carriage-way, 1-meter road shoulder on each side and 1-meter for drainage) on flat land. In areas with steep topography, such ROW width requirements may add-up. Reflecting from the on-going Dili-Ainaro road project, additional 1 – 5 meters for slope cutting and installation of embankments can be anticipated.
19. The Project will be completed by replacing existing macadam road which will be improved and resurfaced with bitumen. There will be drainage structures rehabilitation and slope protection work to stabilize the road embankment. Detailed design for the Aituto – Hatubuilico – Letefoho – Gleno is currently being prepared. The Project will be completed by (i) pavement reconstruction with selective widening if required; (ii) improvement of drainage structures to meet forecasted rainfall volumes and intensities; (iii) clearing and improvement of culverts; (iv) construction of reinforcement of slope stabilization structures; and v) introducing road marking and signage and other measures to improve road safety.

Figure 1.1: Project Location of Branch Road Aituto to Gleno

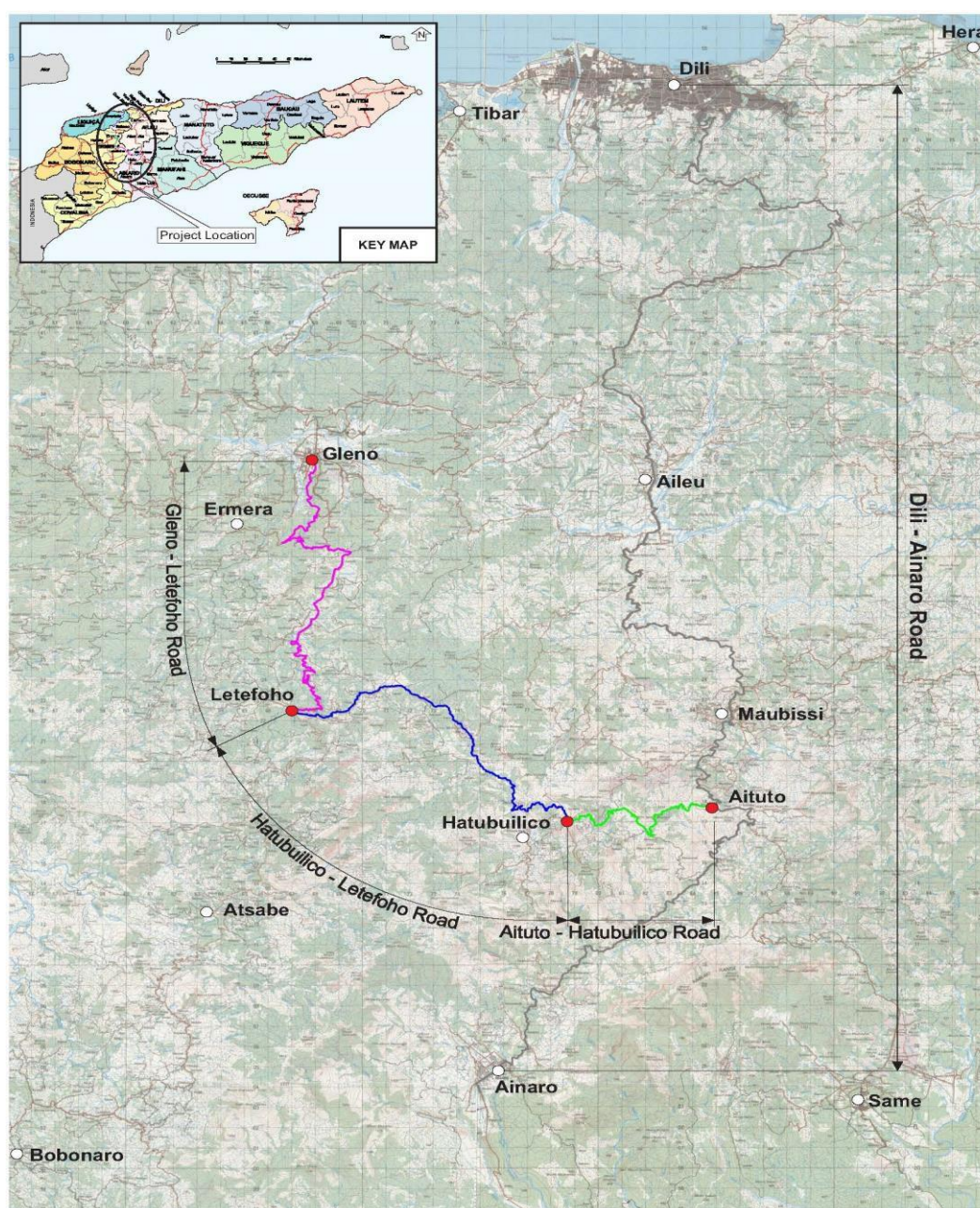


Source: KEI Consultant, 2018

20. As the first phase of a program to improve the Gleno–Maubisse corridor, the two project roads sections (totaling 44.3 km) have been proposed based on the prioritization results of the feasibility study and the readiness for implementation. The second phase of the upgrading of the Gleno–Maubisse corridor will be defined during implementation and it is envisaged that will be financed under an additional financing to the BRP or as a new standalone project. This sub-component will also finance the construction of the upgrading works and related supervision consultancy.
21. The Project will upgrade the Gleno-Letefoho and Letefoho-Hatubuilico Junction road section, which include the Gleno-Letefoho section (25.8 km) and Letefoho-Hatubuilico Junction (18.5 km) road sections of the Gleno-Maubisse corridor (66.1 km) to a national road standard. The existing carriageway Gleno to Letefoho road section is on average 5-7 meters (5 – 7.5 meters of right of way). The current traffic is 843 vehicles per day with 64 percent% motorcycles. Several parts of this section have been widened through an on-going GoTL's road emergency project, which started in 2018 and is expected to conclude by end of 2019. The existing carriageway between Letefoho to Hautubuilico is on average 3-4 meters (4-5 meters right of ways). The current traffic is 418 vehicles per day with 79 percent% motorcycles. Topographical feature on which the road traverses includes mountainous terrain and the road is in poor condition along narrow widths.
22. Widening of the above select sections will vary but is generally estimated to require between 0 to 3 meters on each side to bring the current roads' Right of Way (ROW) to the national standard. The minimum requirement of the ROW for the Branch Road is on average 9 meters (6-meter carriage-way, 1-meter road shoulder on each side and 1-meter for drainage) on flat land. In areas with steep topography, such ROW width requirements may add-up. Reflecting from the on-going Dili-Ainaro road project, additional 1 – 5 meters for slope cutting and installation of embankments can be anticipated.
23. The upgrading of Section 2 (Hatubuilico to Letefoho) will require land acquisition, asset removal and resettlement community houses. Potential impacts on Section 3 are currently assessed as low since the existing roads have been widened through the on-

- going GoTL's road emergency project. The project's further assessment on impacts on land and properties, along with a complete inventory of lossess has been prepared and provided in a standalone Resettlement Action Plan (RAP).
24. The design will incorporate climate resilience considerations, considering (i) pavement upgrading with selective widening to bring the project roads to national standards; (ii) improvement of drainage structures to meet forecasted rainfall volumes and intensities; and, (iii) construction or reinforcement of slope stabilization structures. Where roads served pass through urban areas, attention will be given to safety improvements, orientation signage, bus stops, and sidewalks.
 25. The Executing Agency for the improvements and enhancements of Aituto – Hatubuilico – Letefoho – Gleno is the Ministry of Public Works (MPW). Within MPW the key agency for implementing will be the Project Management Unit (PMU) that has been established to manage and implement projects financed wholly or partially by GoTL's development partners. The PMU will be responsible for day to day management of the Project, including the implementation of required safeguards measures. The PMU was supported by a consulting firm to assist with the preparation of this SEIS/ESIA.
 26. The environment climate and weather in the project area is tropical, hot and humid, dominated by rugged mountain landscape, steep terrain, and gorge, and some are flat areas where there are several settlements. Most of the population relies on agriculture such as coffee plantation and vegetable farming and livestock for livelihoods.
 27. The screening, assessment, and management/mitigation implementation of environmental and social impacts of the Project will be governed by laws, regulations, and standards for environmental assessment and management of GoTL. The Basic Law of Environment (April 2012) covers all relevant aspects of environmental protection and the Decree-Law 5/11 covers requirements for applying environmental license and environmental assessment. In addition to GoTL's requirements, the project must comply with WB's Operational Policy (OP) 4.01 Environmental Assessment, OP 4.04 Natural Habitats, OP 4.10 Indigenous Peoples, OP 4.11 Physical Natural Resources and OP 4.12 Involuntary Resettlement.
 28. In accordance with Government of Timor-Leste's law, the Project has screened as Category B based on categorization that all scale of existing road rehabilitation includes in the B Category. The Project potential adverse environmental impacts are site-specific, though landscape likely changes due to slope cutting for road widening. After all, backfilling and replanting activity will offset in another area. The project category based on OP 4.01 Environmental Assessment will be subject to World Bank's appraisal.

Figure 1.2: Road Link of Aituto – Hatubuilico – Letefoho – Gleno



Source: KEI Consultant, 2018

29. A series of public consultations at the Suco/village and district levels has been undertaken as part of the SEIS/ESIA process. Information about the project activities was broadly disseminated to affected communities along the entire corridor and understanding of site-specific impacts were identified through *Suco* meetings as well as consultations with the authorities and community leaders. Information was provided on the scale and scope of the Project activities and the expected impacts along with their proposed mitigation measures. These consultation processes enabled mutual engagement between GoTL and potentially affected communities to ensure that relevant concerns were adequately captured and considered to inform the project design and development of relevant mitigation measures, including a project-specific Feedback and Grievance Mechanism (FGRM).
30. The project's Grievance Redress Mechanism (GRM) will be established to support resolve issues associated with the Project. The objective of GRM is to provide an accessible, timebound and transparent mechanism for the affected persons to voice and resolve social and environmental concerns linked to the Project. Resolution of these issues and concerns will be undertaken expeditiously and according to the procedures of the GRM. The complaints registry maintained at the site Project office and by the contractor will be subject to monitor. The GRM is based on a mechanism established by PMU for other projects and which are working well.

Table 1.1. Summary of Key Environmental and Social Impacts and Mitigation Measures

PROJECT ACTIVITIES AND IMPACTS	ENVIRONMENTAL & SOCIAL IMPACTS	TYPE OF IMPACT	MEASURES	MONITORING RESPONSIBILITY
PRE-CONSTRUCTION PHASE				
Land acquisition and involuntary resettlement	Social disruption	Negative	Cash compensation for asset & resettlement for housing	PISC, PMU
Climate change resilience action	Decreased landslides and damage on to road infrastructure	Positive	Climate change adaptation measures incorporate into DED	PISC, PMU
Surveying and staking out of road corridor	Minor loss of vegetation during demarcation	Negative	Visual inspection	Contractor; PMU
Site clearing, digging, excavations	Discovery of cultural heritage & historical property	Positive	Stop work order and consultation with community and authority	Contractor; PMU
	Slope failure/landslide	Negative	Visual inspection Prohibition of the clearing, cutting, and excavating in the protected areas.	Contractor; PMU
	Removal of trees and forest	Negative	Compensation and replanting Prevention on adverse impacts on bird's nests and their habitat.	Contractor; PMU
Mobilization of Contractor	Social disruption	Negative	Consultation with local authorities and women local representatives	Contractor, PMU
	Employment opportunities for individuals at local level	Positive/ Negative	Promote equal access to opportunities thorough minimum percentage of women and persons with disabilities in Bidding documents; Consultation with local authorities and women local representatives; Consultation with relevant CSOs and associations [Women Engineers, Women Business Association, ADTL, RHTO]	Contractor, PMU
	HSE Management	Positive	Observation and consultation	Contractor, PMU

	The spread of communicable diseases	Negative to Neutral	Pre-construction – awareness training - check records	Contractor; PMU
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CONSTRUCTION PHASE

Operation of construction equipment	Emissions and dust from plant and materials	Negative	Apply of emission filter & water sprayer to reduce	Contractor; PMU
Works adjacent to water bodies/drainage systems	Slope failure/landslide & physical changes to river bed, culverts & other areas	Negative	Check design, visual observation, and consultation with communities	Contractor; PMU
	Increase risk of SEA (use of water bodies for washing and playing for children and women)	Negative	Approval Code of Conduct; Community awareness raising; Agreement with local community to protect/mitigate child protection risks	Contractor; PMU
Sourcing of materials (river gravels and sands)	Extraction gravel and sand, altering channel and erosion; quarries or borrow pits	Negative	Visual inspection, and review of mineral extraction plan and rehabilitation to meet Government licensing requirements	Contractor; PMU
Spoil disposal or discarded macadam pavement	Impacts on habitats and watercourses	Negative	Visual inspection, and define disposal location agreed by local authority & landowner, and waiver records kept Prohibition of disposing or discharging materials in the protected areas.	Contractor; PMU

PROJECT ACTIVITIES RISE TO IMPACTS	ENVIRONMENTAL & SOCIAL IMPACTS	TYPE OF IMPACT	MEASURES	MONITORING RESPONSIBILITY
Clearing, cut and fill activities, embankments; Stockpile and staging areas	Slope failure/landslide and sediment contamination of rivers and turbidity	Negative	Visual inspection, and define disposal location agreed by local authority & landowner, and waiver records kept	Contractor; PMU
Run-off, discharges, generation of liquid wastes	Impacts on water quality	Negative	Visual inspection, issue restriction to discharge liquid waste	Contractor; PMU
General activities - solid & liquid waste arising	Uncontrolled unmanaged waste disposal	Negative	Visual inspection, issue restriction to discharge solid & liquid waste	Contractor; PMU
Use of hazardous materials	Spillage, leakage, accidents	Negative	Inspection of storage & review emergency response plan	Contractor; PMU
Accidental damage to existing services	Interference with existing infrastructure; water supply, power, telecommunications	Negative	Plan with utility providers and avoid	Contractor; PCM
Activities outside road encroach habitats	Workers poach animals, eggs, feathers, gather fuelwood & impact habitats	Negative	Inspections to camp, fuel & work sites to check food supply, re-vegetation and no wild animal/parts collected	Contractor; PMU
Accidental impacts of historical/cultural sites	Impacts on PCR or cultural property sites	Negative	Stop work and deal with community appropriately Pre-consultation with Centro Nacional Chega! to identify known sites (public institute on memorization of historical sites related to 1975-1999 period)	Contractor; PMU
Noisy construction plant and equipment	Impacts community and workers	Negative	Review work schedule & provide appropriate noise equipment, and GRM register from the community and resolve	Contractor; PMU
Vehicle parking, traffic safety and access to people's land	Traffic disruption and safety affected	Negative	Inspection, review traffic management and consult with landowners	Contractor; PMU
General work activities	Health, Safety and Environment Risks	Positive	Inspection and review of HSE Plan in CESMP	Contractor; PMU
Presence of construction workers	Disruption, or antagonism,	Negative	Regular communication with communitylocal representatives;	Contractor; PMU
	Communicable diseases and community health	Negative	Awareness raising campaign to local community	Contractor; PMU
	Risk of Gender-Based Violence (GBV) and sexual harassment	Negative	Prevention awareness training to workers; awareness raising campaign and complaint procedure accessible local community; approval of Code of Conduct	Contractor; PMU
The spread of communicable diseases	Roads act as a pathway for the spread of communicable diseases such as HIV and STIs	Negative to Neutral	Every 6 months, for 2-year, mid-term and post-evaluation. Consultations with villagers; Review health records (STIs data)	MPW/WB

Timor-Leste Road Climate Resilience Project (TLRCRP) Branch Road Section Aituto – Hatubuilico – Letefoho – Gleno
SIMPLIFIED ENVIRONMENTAL and SOCIAL IMPACT STATEMENT

Site office, water use, and electricity supplies	Stress on existing resources and infrastructure	Negative to Neutral	Consult with villages along road and power provider	Contractor; PMU
OPERATION PHASE				
Operation of vehicles creating emissions	Emissions increase locally but surface dust reduces	Negative to positive	Visual inspection & road maintenance	MPW
Routine and ongoing maintenance	Blocked drains; gravel repair materials	Positive	Routine maintenance records	MPW/WB
Drainage system maintenance	Alteration of natural flood cycles	Positive	Monitor wet periods and review flood occurrence	MPW/WB
Run-off from road	Loss of soils and water quality in streams & river	Negative	Routine maintenance	MPW/WB
Climate change issues	Unexpected and costly failure of road & Depletion.	Positive	Visual inspection; review rainfall, flood, and landslide	PMU
Easy access to previously difficult to reach areas	Economy improves, hunting and poaching increase.	Positive & Negative	Monitoring and consultations	MPW
	Increase risk of human trafficking and sexual exploitation	Negative	Prevention messaging to newly opened up communities; approval of Code of Conduct	MPW
	Increased access to GBV services available in nearby Municipalities	Positive	Specialized NGO recruited for the project; village focal points trained and prevention measures and support services provided in line with the existing national response protocol for addressing GBV incidents.	Contractor; PMU
Increased traffic	Noise, nuisance, accidents	Negative	Monitoring and evaluation, data collection	MPW/WB
Any other	Unintended or unanticipated impacts	Negative/ Positive	As above, as required	MPW/WB

31. Environmental and social impacts during design/pre-construction, construction, and operational phases should be minimized through mitigation measures and environmental monitoring. The main issues are related to design of the Project such as slope stabilization, road safety structures, side drainage and cross drainage/box culverts, control of construction impacts such as spoil and waste disposal, water quality impacts, health and safety concerns, tree felling, traffic interruption, re-provisioning of electrical and utilities, noise and dust during construction.
32. The PMU shall update the Environmental and Social Management Plan (ESMP) based on Detailed Engineering Design (DED) and integrate it into the bid and contract documentation, to ensure these impacts are mitigated to the greatest extent feasible. The contractor will prepare a site- specific construction ESMP (CESMP) and elaborate on how they propose to implement relevant environmental and social risk and impact mitigation measures along with their budget. The CESMP will include the contractor's method statements and proposed actions to cover: waste management and spoil disposal; tree removal and replanting; utilities, electrical re-provisioning; drainage; construction materials management; runoff control, landslide and excavation protection (erosion and sediment control); noise and dust control; traffic management and road safety; including occupational health and safety.
33. The improvement of the Branch Road Aituto – Gleno is expected to yield positive environmental and social outcomes through improved access and mobility amongst surrounding communities by enabling more efficient, and safe travels and improved traffic flows. In the long-run, this project is expected to boost local economies by improving access to commodity trades and tourism. The improvement of crossing drains will reduce the chances of erosion due to uncontrolled run-off and hence improve the safety of road users and local communities along the corridor. In addition, smoother asphalt pavement and improved roadside gutters and drainage are expected to reduce accumulation of roadside dusts due to increased traffic
34. The Project will provide an expanded upgrade national road network, more efficient travel, and improved traffic flows and safety through the improved vertical and horizontal alignment. The potential adverse impacts from construction activities and operation of the road infrastructure are expected to be reduced through engineering design, development of relevant mitigation measures as required under this ESMP and investments in road safety. The project aims to ensure that environmental and social impact mitigation requirements are legally binding to selected contractors by ensuring that relevant provisions are duly incorporated in the contract documents and implemented thoroughly with supervision from an independent supervision consultant team. In the event that any design details, the locations or scope of the proposed Project change, relevant mitigation measures, including budget allocation for environmental and social assessments and implementation of the ESMP and related CESMPs shall be reviewed and revised accordingly.

2. Project Proponent

35. The Executing Agency for the improvements and enhancements of Branch Road Aituto – Hatubuilico – Letefoho – Gleno is the Ministry of Public Works (MPW). Within MPW, the key agency for implementing the project will be the Project Management Unit (PMU) that has been established to manage and implement projects financed the World Bank and other financiers, including the Asian Development Bank (ADB) and Japan International Corporation Agency (JICA) The PMU will be responsible for day to day management of the Project, including the implementation of required safeguards measures. The PMU assisted by a consultant in the preparation of this SEIS/ESIA.
36. The details of the Project Proponent are presented in Table 2.1.

Table 2.1. Project Proponent Details

Address:	REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE, MINISTÉRIO DAS OBRAS PUBLICAS Avenida da Patria, Mandarin, Dili, Timor Leste
Telephone:	3311038 / +670 77422259
Name	Ms. Odete da Costa, Project Manager
Email:	pmu_tlcrp@yahoo.com

3. ESIA Consultants

37. Environmental and Social Impact Assessment was carried out by the environmental and social specialists in the Environmental and Social Team in PMU, who received full support from the Feasibility Study and Design Consultant. The PMU secured the services of ESIA consultants to assist in the preparation of this SEIS/ESIA, who conducted the environmental and social assessment in the mid of 2018, based on the feasibility study and plan of detailed design drawings. The consultants worked under the coordination of Ms. Rahayu Ning Tyas. Subsequently, the PMU Environmental and Social Team were guided in the preparation of the environmental and social assessment by the PMU International Environmental Specialist (IES) in order that the environmental and social assessment would meet the requirements of GoTL and the World Bank. Furthermore, the Environmental and Social Team in PMU work cooperatively to update and fine-tune the environmental and social assessment and prepare the SEIS/ESIA (Table 3.1).

Table 3.1. ESIA Consultants

NAME	CONSULTANT	QUALIFICATIONS
David Green	PMU MPW GoTL	BSc, PhD
Rahayu Ning Tyas	Katahira & Engineers International	BEng, MSc
Jose Paulo Angelo S. S. Pinto	PMU MPW GoTL	BEng
Joao Veniata G. Barreto	PMU MPW GoTL	Dip CLM

4. Description of the Project

4.1 Identification of the Project

38. Timor Leste Branch Roads Project consists of two components and they are described in detail below.
39. **Component 1: Gleno–Maubisse Corridor Upgrading and Road Safety Improvements (US\$72.8 million of which expected IDA financing is US\$55.0 million).** This component consists of the civil works activities to be undertaken on the Gleno–Maubisse corridor and the road safety activities on the rest of the network. The activities include:
- (a) **Sub-component 1.1: Gleno–Letefoho and Letefoho–Hatubuilico Junction roads sections upgrading (US\$70.8 million).** This component would upgrade the Gleno–Letefoho (25.8 km) and Letefoho–Hatubuilico Junction (18.5 km) road sections of the Gleno–Maubisse corridor (66.1 km) to National roads standards. The designs will incorporate climate resilience considerations, considering: (i) pavement upgrading with selective widening to bring the project roads to national standards; (ii) improvement of drainage structures to meet forecasted rainfall volumes and intensities; and, (iii) construction or reinforcement of slope stabilization structures. Where roads serve pass through urban areas, attention will be given to safety improvements, orientation signage, bus stops, and sidewalks. As a first phase of a program to improve the Gleno–Maubisse corridor, the two project roads sections (totaling 44.3 km) have been proposed based on the prioritization results of the feasibility study and the readiness for implementation. The second phase of the upgrading of the Gleno–Maubisse corridor¹ will be defined during implementation and it is envisaged that will be financed under an additional financing to BRP or as a

¹ The remaining roads to be improved on the Gleno–Maubisse corridor are: (i) Hatubuilico Junction to Aituto road section (11.9 km); and (ii) the links to the corridor of the towns of Ermera (4.8 km) and Hatubuilico (5.2 km). The road section between Aituto and Maubisse (9.9 km) was already improved under RCRP.

new standalone project. This sub-component will also finance the construction of the upgrading works and related supervision consultancy.

- (b) **Sub-component 1.2: Road Safety Improvements (US\$2.0 million).** This sub-component will cover civil works and/or goods to address road safety issues on roads other than on the Gleno–Maubisse corridor roads, such as road signage and pavement markings or black spot improvements at locations to be identified by GoTL. The scope of sub-component 1.2 will be decided during implementation with support of a road safety advisor to be hired under the project. The civil work in addressing road safety issues is expected to be minor. The environmental and social impacts are expected to be minor, site-specific, reversible and non-cumulative and the mitigation measures in the form of Standard Operating Procedures are readily available.

- 40. **Component 2: Institutional Strengthening and Project Management (US\$4.0 million of which expected IDA financing is US\$4.0 million).** This component aims at helping strengthening capabilities within MPW and DRBFC on issues related to road assets management, road safety and road maintenance. It will finance technical assistance, equipment, and operational costs associated with the implementation of the Project. It will also finance studies required for the preparation of potential future investments in the road sector. This component is split into three sub-components, as detailed below.

- (a) **Sub-component 2.1: Technical Assistance (US\$1.6 million).** This sub-component involves knowledge, capacity building, data and funding to support transport sector development. Technical Assistance activities include: (i) data collection on road inventory, traffic and condition on national and district roads (approximately 2,240 km) to update the Road Asset Management System² for supporting monitoring, planning and programming of road works; (ii) piloting of multi-year performance based maintenance contracts on national roads³ (two years of maintenance on approximately 125 km) through contractors using community-based groups with female participation, including strengthening supervision activities done by DRBFC; (iii) road safety capacity building program within MPW through the hiring of a road safety advisor to DRBFC;⁴ and, (iv) geotechnical capacity building program within MPW through the hiring of a geotechnical advisor to DRBFC.⁵ In conjunction with the Interim Guidelines on the Application of Safeguard Policies to Technical Assistance (TA) Activities in Bank-Financed Projects and Trust Funds Administered by the Bank (issued January 2014), this is a Type 1 TA Building Client Capacity and no safeguard instrument is required.

- (b) **Sub-Component 2.2: Design of Future Projects (approximately US\$1.4 million).** This sub-component will finance feasibility/technical studies and designs required for the preparation of potential future investments in the road sector (approximately 40 km). These road sections to be designed will be selected during project implementation and as of the date of the project preparation, road links to Hatubuilico town and Ermera town (total 10 km) are being considered. Additional 30 km of road design has not been determined. The GoTL confirmed that the design of future projects will be limited to road rehabilitation/improvements, not new roads. In conjunction with the Interim Guidelines on the Application of Safeguard Policies to Technical Assistance (TA) Activities in Bank-Financed Projects and Trust Funds

² The Road Asset Management System is being developed with ILO, ADB and JICA support.

³ The maintenance contracts will be implemented on Lots 1 and 3 of the ongoing RCRP (around 40 km) and other national roads to be selected by MPW.

⁴ The tasks would include: training of MPW staff, assessment of national and district roads for road safety risks, preparation of road safety improvement works program, and road safety audits of project designs. The assignment is expected to last for 12 months spread over two years.

⁵ The tasks would include: training of MPW staff, assessment of national and district roads for geotechnical hazards, preparation of road geotechnical remedies works program, and geotechnical audits of project designs. The assignment is expected to last for 8 months spread over two years.

Administered by the Bank (issued January 2014), Term of References (TORs) for these environmental and social studies should be made available for references in future projects.

- (c) **Sub-component 2.3: Project Support (US\$1.0 million).** This sub-subcomponent will finance operational costs associated with implementation of the Project, training of MPW staff, GVB and SEA prevention measures, and goods needed by the Project. It also includes yearly audits of the project accounts to be submitted to the Bank.
41. **Component 3: Contingent Emergency Response (US\$0 million).** Since Timor-Leste will remain vulnerable to climate change and severe weather events, even with the successful implementation of the first two components, supporting post-disaster recovery is an important feature of the project. This zero-dollar component is designed to provide swift response in the event of an Eligible Crisis or Emergency, by enabling GoTL to request the Bank to reallocate project funds to support emergency response and reconstruction. Safeguards requirement will follow the Bank Procedure on the Preparation of Investment Project Financing Under Situation of Urgent Need of Assistance or Capacity Constraint issued on October 1st, 2018. The project will prepare a CERC Project Operations Manual, including safeguard approval process, within six months of project effectiveness.
42. The subsequent chapters in this SEIS/ESIA focus on Component 1.1. It covers all sections 1-3, however the planned investments under the existing Timor Leste Branch Roads project will only cover Section 2 (Hatubuilico - Letefoho) and Section 3 (Letefoho – Gleno).
43. This Simplified Environmental Impact Statement covers ± 60 Km of road improvement Project that consists of the 3 sections within Ainaro Municipality and Ermera Municipality. This Project starts from the junction of Aituto and straight ascends to the west to Hatubuilico, subsequently turn down to the northwest to Letefoho, subsequently turn to the north to Gleno City.
44. The Project will be financed by the World Bank. Related feasibility and design studies and this environmental and impact assessment were financed under the on-going Timor-Leste Road Climate Resilience. Focus on Gleno to Maubisse corridor has been assessed as a national priority since this road section supports community access to the major population centers between Ainaro and Gleno, as well as provides access to tourism and trades. In the long-run, improved road access and mobility is expected to boost local economic development, which mainly depends on coffee production. The existing bitumen road will be improved and resurfaced to bring the section sections up to National Road Standard. A Detailed Engineering Design (DED) for the Project is currently being prepared.

4.2 Category of the Project

45. In accordance with the environmental regulation (DL 5/2011, Annex II), the Project was screened as Category B. This category was informed by the scope of the road works which focuses on rehabilitation of the existing road sections. The Project's potential adverse environmental impacts are site-specific, although there is likelihood that the project may induce impacts on the landscape due to slope cutting for road widening. The Detailed Engineering Design (DED) is currently considering designated locations for backfilling and other material disposal to confine potential adverse impacts along with replanting activities in the affected areas. The project's category based on OP 4.01 Environmental Assessment will be subject to World Bank's appraisal based on the risk assessment and impact analysis provided in the SEIS/ESIA.
46. The Project involves reconstruction and resurfacing the existing road sections which include slope stabilization, and improvement of crossing drains. The proposed road infrastructure between Gleno – Maubisse corridor needs to be improved because the standards and conditions of many of the roads in Timor-Leste are inadequate to meet

the rapidly growing demand for efficient and safe travels. Lack of access and mobility due to poor road infrastructure has adversely impacted local economic growth and broadernational development.

4.3 Location and Scale of Project

47. The Project road corridor is within 2 municipalities i.e. Ainaro and Ermera Municipality. It begins at Km 0+00 at Aituto on the intersection from Maubisse to Ainaro, ± 38 Km south of Dili. Project ascends from the junction of Aituto runs in a westerly direction up to the mountainous area at an elevation around 2,107 m a.s.l. adjacent to the “protected area” southeastern of Mt. Ramelau.
48. The existing road alignment intermittently passes by some villages, especially when runs down toward the direction of Letefoho Administrative Post. Eventually, this road will join another existing municipality road, on the way from the section of Letefoho Administrative Post to Gleno City. The GPS coordinates at the beginning of this project at Aituto are S -8° 54' 1" and E 125° 35' 34", and the end of the branch road is on the Gleno City at -8° 43' 26.00" S and 125° 26' 10.00" E.

4.4 Project Boundary

49. The Gleno-Maubisse corridor is comprised of three sections. The 1st Section i.e. Aituto to Hatubuilico road is 11.9 Km length, ascends along a winding route and steep gorge from south to west direction to Hatubuilico Administrative Post within Ainaro Municipality. Subsequently, 18.5 Km road length of Section 2 start from Hatubuilico descends through some unstable ground to Letefoho within Ermera Municipality. Section 3 (± 25.8 Km) will runs straight to the north passing through steep terrain and instability slope condition on the way to Gleno City, as the end of Branch Road. The Branch Road will only finance Sections 2 and 3 of the entire corridor. Financing for Section 1 is currently not determined and therefore, the existing SEIS/ESIA and its associated ESMP will be revisited and updated following future GoTL’s decision to include the section into the project’s scope.
50. As the first phase of a program to improve the Gleno–Maubisse corridor, the two project roads sections (totaling 44.3 km) have been proposed based on the prioritization results of the feasibility study and the readiness for implementation. The second phase of the upgrading of the Gleno–Maubisse corridor will be defined during implementation and it is envisaged that will be financed under an additional financing to the BRP or as a new standalone project. This sub-component will also finance the construction of the upgrading works and related supervision consultancy.
51. The Project will upgrade the Gleno-Letefoho and Letefoho-Hatubuilico Junction road section, which include the Gleno-Letefoho section (25.8 km) and Letefoho-Hatubuilico Junction (18.5 km) road sections of the Gleno-Maubisse corridor (66.1 km) to a national road standard. The existing carriageway Gleno to Letefoho road section is on average 5-7 meters (5 – 7.5 meters of right of way). The current traffic is 843 vehicles per day with 64 percent% motorcycles. Several parts of this section have been widened through an on-going GoTL’s road emergency project, which started in 2018 and is expected to conclude by end of 2019. The existing carriageway between Letefoho to Hautubuilico is on average 3-4 meters (4-5 meters right of ways). The current traffic is 418 vehicles per day with 79 percent% motorcycles. Topographical feature on which the road traverses includes mountainous terrain and the road is in poor condition along narrow widths.
52. Widening of the above select sections will vary but is generally estimated to require between 0 to 3 meters on each side to bring the current roads’ Right of Way (ROW) to the national standard. The minimum requirement of the ROW for the Branch Road is on average 9 meters (6-meter carriage-way, 1-meter road shoulder on each side and 1-meter for drainage) on flat land. In areas with steep topography, such ROW width requirements may add-up. Reflecting from the on-going Dili-Ainaro road project, additional 1 – 5 meters for slope cutting and

installation of embankments can be anticipated.

53. The upgrading of Section 2 (Hatubuilico to Letefoho) will require land acquisition, asset removal and resettlement community houses. Potential impacts on Section 3 are currently assessed as low since the existing roads have been widened through the on-going GoTL's road emergency project. The project's further assessment on impacts on land and properties, along with a complete inventory of lossess has been prepared and provided in a standalone Resettlement Action Plan (RAP).
54. The design will incorporate climate resilience considerations, considering (i) pavement upgrading with selective widening to bring the project roads to national standards; (ii) improvement of drainage structures to meet forecasted rainfall volumes and intensities; and, (iii) construction or reinforcement of slope stabilization structures. Where roads served pass through urban areas, attention will be given to safety improvements, orientation signage, bus stops, and sidewalks.
55. The Project's boundary has been defined by considering direct and indirect potential impacts. However, the current scope of the SEIS/ESIA does not include any additional areas required for spoil disposal and temporary stockpiles and associated facilities such as engineers offices and laboratory facilities, contractor camp and yard, including quarries, borrow pits, manufacturing areas (crushers, batching plant and asphalt mixing plant) etc. These associated facilities will only be determined during the project implementation and to the extent possible, reflected in the DED being prepared to enable identification of potential impacts. The latter will be subject to future assessments whereby their mitigation measures will be developed prior to any construction and physical works once the locations have been selected. The PMU and World Bank will retain review and clearance functions for any environmental and social assessments and mitigation measures developed during project implementation by the contractors.
56. Understanding the potential locations of the above associated facilities is important to confine geographical footprints to select locations where potential environmental and social impacts are assessed as manageable and hence, relevant provisions can be reflected in the bidding documents and contracts. In the current DED, potential temporary stockpiles are proposed to be located in unused land plots with stable topography to avoid risks of run-off. Associated facilities such as offices and laboratory facilities, and contractor camps are usually located within the proximity of the project sites (i.e. within 1,000 m) to minimize travel time and fuel consumption. These locations are yet to be identified following the preparation of the project's DED for sections 2 and 3. Procedures for reviewing, assessing environmental and social risks, and clearing contractors' proposals for these associated facilities have been included as part of the ESMP.
57. Understanding that there will be several selected disposal areas of soil and other construction material needed as a result of slope cutting and road widening, location selection for these sites shall take into consideration the Protected Natural Areas (PNA) determined by the GoTL, as well as trees, community claims and land use of these sites and geological stability of the impacted areas. The quarries and borrow pits will be located at relevant material sources at a safe distance from community use and to the extent possible are concentrated to limit footprints and enable proper management. Location selection for the manufacturing facilities (i.e. crushers, batching plants, and asphalt mixing plants) etc. will be screened against environmental and social risks and impacts and approved by the PMU and World Bank. Relevant requirements for these associated facilities include minimizing community health and safety risks, avoidance of access and land use restriction risks, and potential impacts on the protected areas.
58. The construction works will take place along the entire corridor in Sections 2 and 3 up to 5.0 meters on either side of the existing road centreline, or about 6.5 meters of either side to allows availability of working space. Such permanent and temporary use of land and space will be consulted with affected communities and relevant compensations for losses will be further detailed in the RAP. At the time of the development of this

SEIS/ESIA, the locations of the associated facilities as indicated above have not been identified since such identification will only be finalized as part of the contract implementation.

59. The locations for associated facilities will be identified at the pre-construction stage after the contractor has been mobilized. For this reason, this SEIS/ESIA only includes mitigation measures for the main road works. Whereas, for the the associated facilities, relevant procedures have been established in the ESMP because the types and scales of such activities are broadly known through the on-going and previous road project implementation. Relevant site-specific environmental and social assessments will be undertaken and the ESMP will be updated at the pre-construction stage whereby relevant provisions and budget requirements shall be incorporated in the CESMP which will be subject to PMU and World Bank's review and approval at the pre-construction stage.

4.5 Villages

60. The SEIS/ESIA covers the entire Maubisse-Gleno corridor and hence, the assessment covers all Sucos and hamlets along the corridor (see Table 4.1).
61. The Branch Roads play an important role for central Timor-Leste, linking its east to its west, while also serving transit traffic along the project road and onward connections to the Dili–Ainaro and the Gleno–Tibar corridors. The Gleno–Maubisse corridor starts at the city of Gleno, passes through the towns of Ermnera, Letefoho, Hautubuilico, and Aituto and ends at the town of Maubisse. Gleno is a city 30 km to the southwest of Dili and is the capital of the municipality of Ermera. Maubisse is a historic town in the hills 70 km south of Dili, in Ainaro District. It is a popular tourist destination and a weekend visiting spot for people from the capital. Agricultural activities are evident along the corridor. Coffee producers are concentrated particularly in Ermera district. The Hatubuilico town is on the route to Timor-Leste's top tourist destination, Mount Ramelau. It is anticipated that, in addition to enhancing connectivity in the project areas, the project will help develop the agricultural and tourism sector by improving road access specifically to the country's highest coffee producing areas and tourist destination. The BRP will improve the Gleno- Letefoho and Letefoho- Hatubuilico Junction sections of the corridor, while the Hatubuilico Junction-Aituto section and the links to the towns of Ermnera and Hatubuilico will be improved at a second phase of the project. The section between Aituto and Maubisse was already improved.
62. Based on the identification, there are three (3) sucos within the administrative post area of Maubisse and Hatobuilico that served by this Project. On the other side, there are eleven sucos within both administrative posts of Letefoho and Ermera in Ermera Municipality. Since the BRP only covers sections 2 and 3 within the proposed corridor, project impacts are anticipated to affect five Sucos (villages) in these sections, namely Haupu, Guololo, Eraulo, Estado, and Humboe. These sections will pass schools, markets, as well as sacred sites and hence, pre-construction and construction related impacts are anticipated.
63. While there is a widely-used suco boundary map in Timor Leste, it should be noted that within the country, suco affiliation is more of a cultural concept rather than a geographic and administrative boundary. Communities might reside within the geographical boundary of one Suco, but may identify themselves as residents or members of another suco.

Table 4.1. Affected Municipalities and Villages

Municipality:	Ainaro	Ermera
Administrative Post:	Maubisse and Hatubuilico	Letefoho and Ermera
Village/Sucos:	<i>Horai-Quic, Mulo, and Nunomogue</i>	<i>Catrai-Caraic, Haupu, Ducurai, Goulolo, Eraulo, Estado, Humboe, and Riheu.</i>

Hamlets/Aldeias:	<i>Horai-Quic (4 aldeias); Mulo (8 aldeias); and Nunomogue (8 aldeias)</i>	<i>Catrai-Caraic (9 aldeias); Haupu (12 aldeias); Ducurai (13 aldeias); Goulolo (4 aldeias); Eraulo (6 aldeias); Estado (12 aldeias); Humboe (4 aldeias); and Riheu (5 aldeias).</i>
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64. Pre-construction activities usually commence following contractor procurement and completion and approval of relevant CESMPs. Prior to such CESMP approvals, any construction works will be strictly prohibited. Establishment of associated facilities will take place during the pre-construction phase. The siting and management facilities will need to be reflected in the CESMPs and approved by the PMU and World Bank during project implementation.
65. Construction of other associated facilities such as quarries, spoil disposal areas, borrow pits, stone crushers, batching plants and asphalt mixing plants will likely take place during the construction phase. The siting and management of these facilities will be subject to environmental and social assessments and review and clearance processes by the PMU and World Bank. Potential locations for these associated facilities have not been identified at the time of SEIS/ESIA development process.
66. All of the asphalt and aggregate suppliers must have a valid license to operate and are eligible to be registered by the GoTL as official suppliers. When the Contractor decides to operate its own plant, the Contractor needs to follow the requirements of the prevailing environmental license and the project's ESMP such as conducting environmental and social assessments of the proposed sites, obtaining location approvals from relevant authorities, securing mineral licenses, compensating asset and land owners and users consistent with the project's RAP, and completing a Site Specific Environment and Social Management Plan to the satisfaction of the authorities, PMU and the World Bank for each, and every new location from which construction materials are obtained for this project. The Contractor has to submit a site plan and operational methodology to the Supervision Consultant as part of the CESMP.

4.6 Project Construction

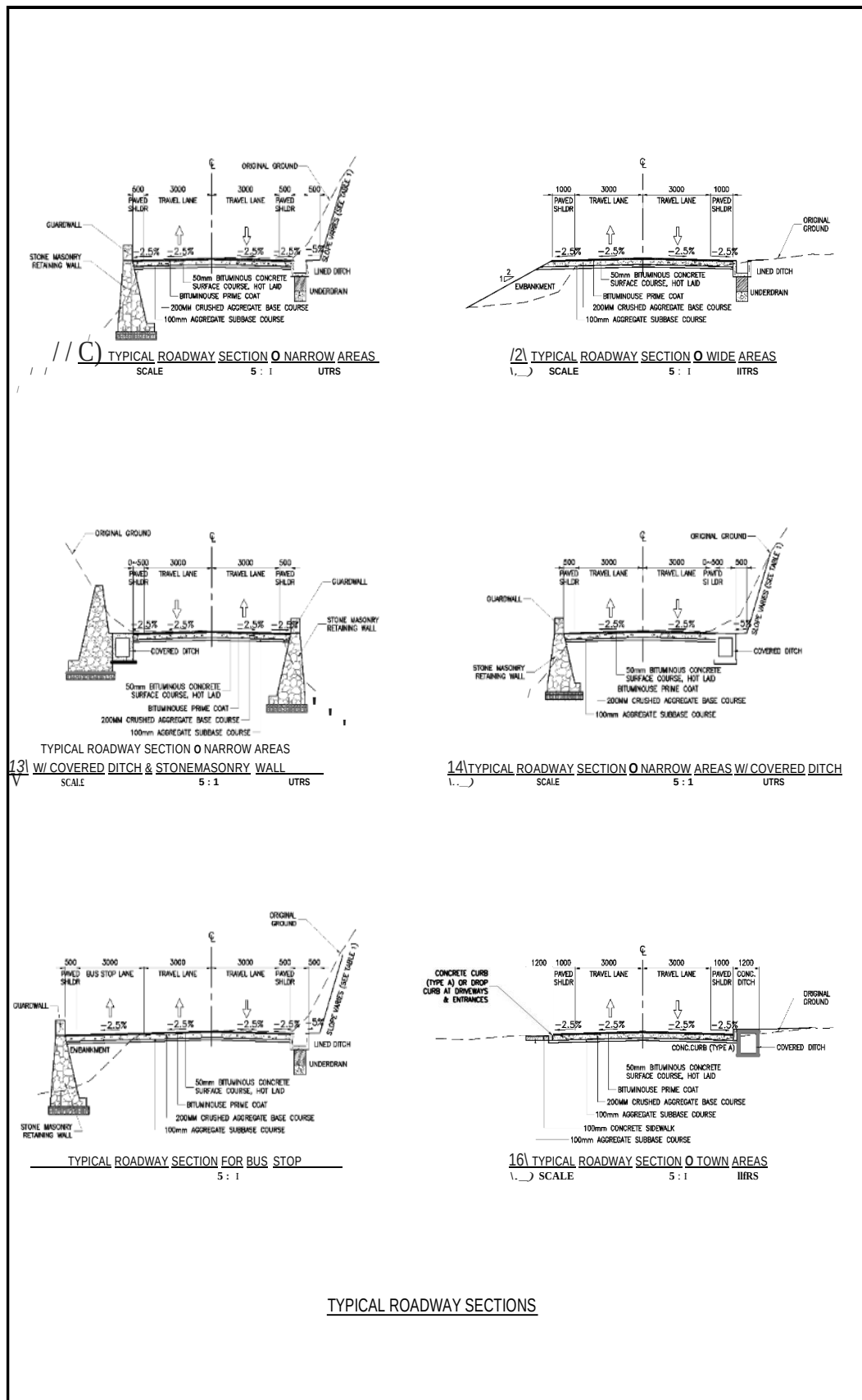
67. Project road construction works will include the following activities:
 - Land clearing, including removal of trees
 - Removal of macadam layer
 - Hauling and disposal of old macadam materials
 - Hauling of construction materials, including removal of unsuitable materials
 - Excavation and carriageway widening
 - Improvement of embankment
 - Slope stabilization strengthening
 - Improvement of drainage and culverts
 - Laying and compaction of sub-base and base course
 - Application of a prime coat
 - Laying and compaction of asphalt
 - Installation of Road Safety features
 - Marking of pavement (side and center)
 - Installation of rumble strips and traffic signs
68. Recruitment and mobilization of manpower needed for construction activity will include the provision of site engineers, technicians, and surveyors, heavy equipment operators

and assistants, mechanics, general laborers, and security. Given the manpower from local should be considered, hence as far as possible some of the manpower will be sourced from local people, especially for semi-skilled and unskilled work according to the Contractor requirements. Following GovTL commitment and World Bank policy, a minimum 30% of women shall be engaged as workers, which shall not fall below 20% for technical and management positions. Design of internal procedures to ensure effective incorporation of women need to be developed due to entrenched social gender norms that expect women are main carers of children.

69. The initial Project activity is land clearing of the existing carriageway to remove surplus materials and obstructions such as trees, stones, stumps, and slopes. Some available topsoil will be stockpiled for later use. Subsequently, roots, logs, vegetation, wastes, and debris will be disposed of at designated and approved locations. Meanwhile, tree timber will be returned to the owners for reuse following payment of appropriate compensation.
70. The Contractor will remove the whole or part of structures and obstructions, then backfill the trenches, and pits. They will be required to implement CESMP as obliged in the contract satisfactory to the PMU and the World Bank. These include disposal management of soil, debris materials and any other obstructions at designated and approved locations and which are not permitted to remain at the project sites.
71. Relocation of utilities will likely be necessary for certain sections. The utilities will be mainly power lines and community water supply lines and water tanks. Relocation of power lines will generally be the responsibility of the ECTL (*Electricidade de Timor Leste*), while relocation of community water lines and rebuild of water tank shall be done by the assistance of the Contractor. Such relocation of these facilities will be approved by the PMU in consultation with affected communities. Temporary utilities or replacement of these utilities will be provided by the contractor with permission from the utility owners and communities.
72. Contractor's obligation during the pre-construction stage is the preparation of a Construction Environmental and Social Management Plan (CESMP), which is a detailed plan by the contractor on how they will implement the ESMP that accompanies this SEIS/ESIA. Guidelines on the specification for the CESMP are presented in **Appendix 6**.
73. Drainage structures consist of culverts and roadside ditches. Some of the culvert links to natural waterways such as small tributaries that run into downstream. Several of the culverts are insecure and currently not in a good condition due to previous landslides and cracks. The DED will evaluate and include measures to accommodate the design of run-off culverts and line drains. Some of these drainage structures will be cleaned and repaired and replaced.

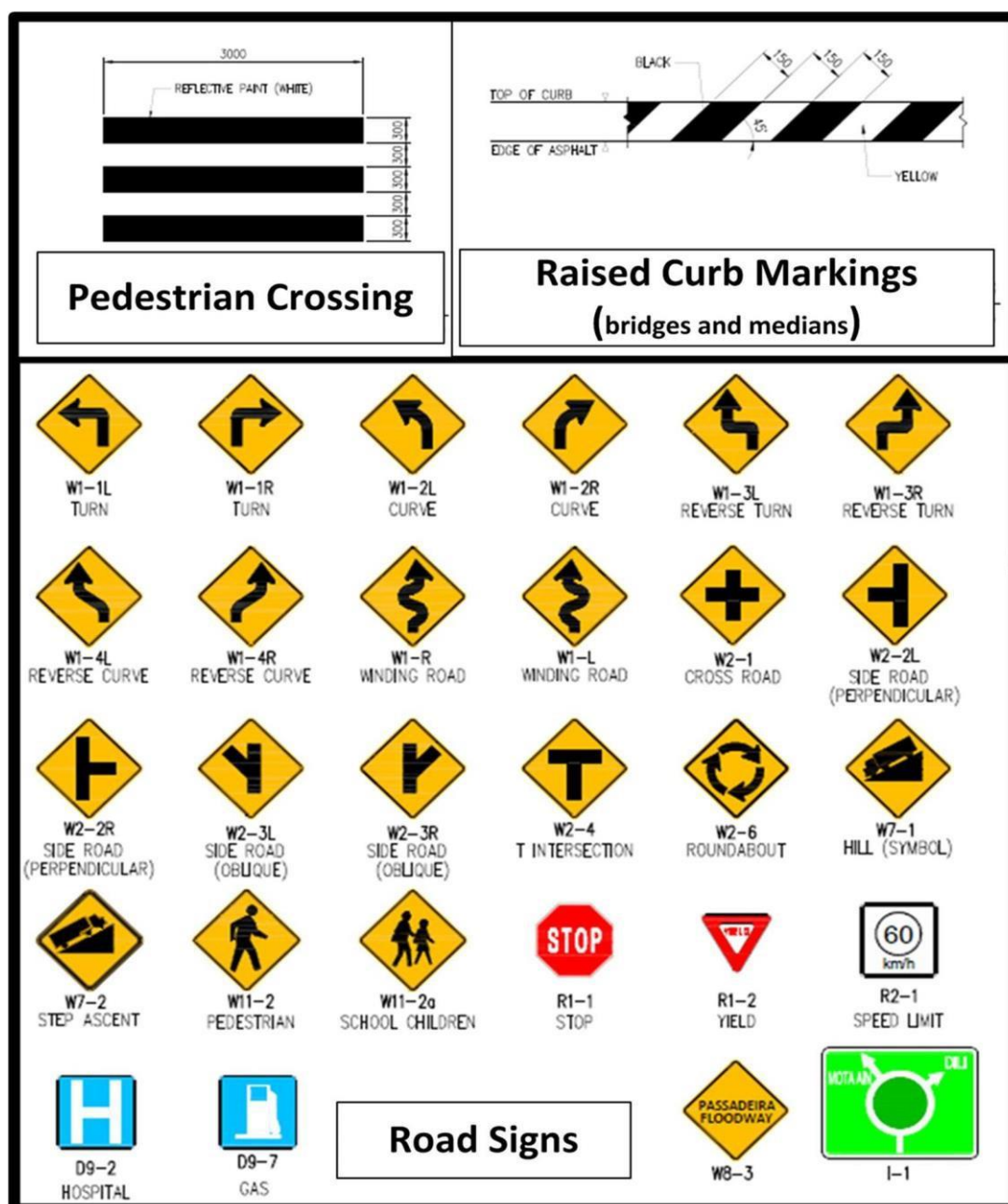
74. Improvements of the existing culverts will include cleaning, repairs using concrete for wing and headwalls to protect catch basins as deemed necessary. Headwalls and wing walls may be added at the end of culvert barrels for the following reasons:
 - To improve hydraulic efficiency by streamlining the flow towards the opening;
 - To support structural stability by increasing seepage paths;
 - To retain fill materials and reduce erosion of embankments slopes;
 - To offset the effect of uplift forces.
75. The condition of several sections along the project road is unstable. Moreover, in some locations, the road was damaged. Stabilization of the road sections has been made through installation of gabion walls, while several sections were only propped up by wood logs. Various factors might contribute to the situation of road damage, such as surface water run-offs, inadequate compaction and the use of non-homogenous filling material during previous rehabilitation work.
76. Problems of road stabilization will be addressed through a carefully detailed engineering design incorporating different measures. With regards to water-related damage, new measures will include constructing rehabilitating and repairs for road-side drainage and clearing and repair of culvert structures. Stronger embankment will be introduced in few places as well as cleaning drainage structures to allow improved drainage along the road sections during storms and heavy rains.
77. The existing conditions of the roadway cause excessive levels of traffic noise because of unfavorable surface quality which in turn generates airborne dusts during periods of high wind and when vehicles pass. Surface runoffs are also generated during the wet season when rainfall washes over currently unpaved surfaces. These negative environmental and health impacts of the existing roadway would be eliminated by the proposed road improvements financed by the project.
78. Typical of roadway structures are shown in Figure 4.1. These types of structures will be considered, and construction will include gabions. Whereas instabilities along the hilly terrain will be addressed through the installation of additional slope stabilization measures such as the construction of retaining walls and stone masonry, further slope cut and bioengineering work.
79. Road safety measures for this project involves provision of adequate and reflective pavement markings that will delineate the boundary between opposing and parallel traffic and pedestrians; covered drains adjacent to the road asphalt paved shoulders where pedestrians especially school children can walk safely; adequate road signs that will serve as warnings and information signs. Road safety features are shown in Figure 4.2.
80. In addition, road safety features shall be provided such as metal guardrails, road signs, and guideposts. Locations of these improvements shall be decided during the fine-tuning of the DED.
81. The Contractor needs to identify spoil disposal sites. Every landowner and user of affected land plots and local communities must be consulted and properly compensated consistent with the project's RAP. Spoil disposal sites must have been agreed with local landowners and the local authority and shall be checked by Project Implementation and Supervision Consultant (PISC) and verified and approved by PMU. The methods for environmental management of spoils disposal sites shall be presented by the Contractor in the Construction Environmental and Social Management Plan (CESMP).

Figure 4.1: Typical Roadway Section types



Source: KEI, Feasibility Study, 2018

Figure 4.2: Typical of Road Safety features

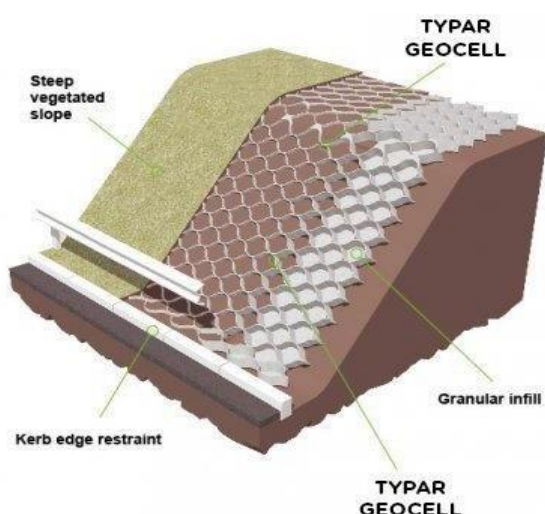


82. Bio-engineering works will involve preparation of excavated backfilling and embankment slopes and combination of an engineering structure (e.g. retaining wall and gabion) and slope planting with selected vegetation such as vetiver grass (*Chrysopogon zizanioides*), setaria grass (*Setaria sphacelata*), elephant grass (*Pennisetum purpureum*), and other local vines on the slopes that will help reduce soil erosion, improve soil stability, minimize seepage of water to the ground and help prevent landslides. Several techniques have been considered for use in the project as follows:

- Turfing on embankment slope to armor the surface;
- Grass slips (rhizome plantation) on the embankment to armor the embankment slope;
- Brush layer of hardwood cuttings in embankment slope to reinforce the slope to avoid encroachment of the embankment by local people.

83. Bioengineering is targeted to be applied in several locations, especially on an unstable slope or fragile soil to support artificial slope stabilization. The locations will be further confirmed during public consultations and the preparation of detailed design during project implementation; in response to local conditions and factors.
84. The Project will transition to the operations and maintenance stage following the completion of construction and the defects notification period. The regular maintenance work will involve patching of the pavements, trimming of vegetation along the roadside, maintenance of road safety features, e.g. pavement markings, drainage etc. Given the projected volume of vehicular traffic is moderate, thus noise and air pollution are not expected to be a concern during the road's operational stage. Therefore, only a few significant indirect environmental and social impacts are predicted during this stage, particularly related to the safety issue of the passengers.

Figure 4.3: Steep Vegetated Slope with Vetiver Grass



4.7 Justification and Need for the Project

85. The existing road infrastructure needs to be improved and upgraded because the standards and conditions of roads in Timor-Leste are inadequate to meet the rapidly growing demand for efficient travel. These road conditions will limit national development and economic growth in the country.
86. The GoTL has recognized the importance of developing physical infrastructure including road network as part of its program to reduce poverty in the country. This is specifically mentioned in the National Strategic Development Plan (2011 – 2030) where it is noted that “an extensive network of quality and well-maintained roads is essential to connect our communities, promote rural development, industry, and tourism, and provide access to markets.”
87. The Project is a sub-project of the Timor-Leste Road Climate Resilience Project (TLRCRP), as a Branch Road of Dili – Ainaro with widening and upgrading to the national road standard. TLRCRP aims to accelerate economic opportunities, promote tourism growth, increase agricultural productivity and reduce poverty through the improvement of road connectivity to district towns, including support climate change resilience of some areas in Timor-Leste.
88. Existing conditions of the Aituto to Gleno road vary. Some sections were considered to be in a fair condition in some places but poor and unacceptable/unsafe in many others. Many parts of the road sections are still gravel sealed and some parts have completely lost their bitumen seals due to water inundation. Some sections are experiencing severe

leading to cracks and uneven pavement. The compacted shoulders are often in a poor condition and overgrown with grasses and other plants.

89. The Strategic Development Plan (SDP) of Timor-Leste outlines GoTL's vision for the rehabilitation of the national roads. The program of the Sixth Constitutional Government includes a major program of road rehabilitation, repair, and improvement. Asian Development Bank (ADB), European Union (EU), the World Bank (WB), and the Japan International Cooperation Agency (JICA) are coordinating their support and much work is already under implementation.
90. The overall strategy aligns with the goals of the SDP and envisages continuing support for a medium-term approach to the rehabilitation, and maintenance of the core road network with emphasis on investment projects that are of national importance and which provide an inclusive pattern of economic growth, particularly by improving the transport links needed to support growth of the agricultural and rural economy. The World Bank will provide financing to facilitate the rehabilitation of this district road and the project will be administered under the requirements of the World Bank, including safeguards.

4.8 Proponent's endorsement of the project

91. The Project Management Unit (PMU) endorses the findings and recommendations of the SEIS/ESIA. Hence, the project will be implemented in accordance with the recommendations of the SEIS/ESIA and the accompanying Environmental and Social Management Plan (ESMP) to guide the management of environmental and social aspects of the Project.

4.9 Structure of the SEIS/ESIA Report and Methodology

92. This SEIS/ESIA is organized into following Sections, including a non-technical Executive Summary which prepared and presented at the beginning of the report.
 - Section 1: Executive Summary
 - Section 2: Project Proponent
 - Section 3: ESIA Consultants
 - Section 4: Description of the Project
 - Section 5: Legal and Policy Framework
 - Section 6: Description of the Environment
 - Section 7: Alternatives
 - Section 8: Climate Change
 - Section 9: Impact Assessment & Mitigation Measures
 - Section 10: Summary of Environmental and Social Management Plan
 - Section 11: Public Consultation, and Information Disclosure
 - Section 12: Difficulties Encountered
 - Section 13: Conclusion and Recommendation
 - Section 14: Non-Technical Summary

Appendices contain additional information and details referred to in the main text.

93. The objectives of this SEIS/ESIA are to:
 - Identify and provide an assessment of the existing environmental and social conditions in the project area including the identification of environmentally and socially sensitive areas;
 - Assess the proposed works and activities to identify their potential impacts, evaluate

the impacts, and determine their significance; and

- Propose appropriate mitigation measures that can be incorporated into the proposed Detailed Engineering Design to minimize any adverse impacts, ensure that residual impacts are acceptable and establish the requirements for monitoring of the project.

5. Legal and Policy Framework

94. The Proponent acknowledges and will require the selected Contractor to uphold the laws and regulations of Timor-Leste. Particularly those pertaining to environmental protection, specifically in regard to compliance with environmental laws, regulations, and guidelines; both in the national or local level.

5.1 Environmental Law and Policy

95. The implementation of the Project will be governed by laws, regulations, and standards for environmental assessment and management of GoTL. The Constitution of Timor-Leste has clearly established the importance of protecting the environment. The Constitution of Timor-Leste establishes a healthy environment as a constitutional right. The Constitution stipulates that:
- Everyone has the right to a humane, healthy, and ecologically balanced environment and the duty to protect it and improve it for the benefit of future generations;
 - The State shall recognize the need to preserve and rationalize natural resources;
 - The State should promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy.
96. The Government of Timor-Leste's Basic Law on Environment (Decree-Law no. 26/2012) came into force in 2012. It sets the framework for other environmental legislation such as the Decree-Law 05/2011 on the Environmental Licensing Law (ELL), and some pending laws and regulations, including the draft of Biodiversity Law.
97. The Environmental Licensing Law implements a licensing system in Timor-Leste, including the Environmental Assessment procedures. According to the Environmental Licensing Law, projects or activities that may impact to the environment are required to undertake a process of environmental assessment; including preparation of an Environmental Impact Statement (EIS) for Category A or Simplified Environmental Impact Statement (SEIS) for Category B; depending on the level and magnitude of potential impacts resulting from and associated with the project.
98. The document of EIS and SEIS shall include an Environmental Management Plan (EMP) that must be prepared according to the procedure established through the ELL and submitted to National Directorate for Environment (NDE). If the Minister determines to approve the project or activity, based on the recommendations of NDE, the Proponent is granted an Environmental License by NDE to conduct the project or activity. The SEIS is approximately equivalent to the Initial Environmental Examination (IEE) required by the World Bank for a Category of B project.
99. In accordance with the Environmental Licensing Law, the Branch Road Project is assessed as Category B; since the proposed works only involves road upgrades and extension of the existing roads. Furthermore, in efforts to comply with the ELL, an Environmental Assessment and EMP must be prepared and submitted to the NDE for approval. In this case, the environmental assessment will be as a Simplified Environmental Impact Statement (SEIS) as required for Category B.
100. The ELL requires (as stipulates in Article 18) that the application for Environmental License should be made to the National Directorate of Pollution Control and Environmental Impact (DNCPIA). Subsequently, the Proponent (MPW) initiates the procedure for SEIS and Environmental License application with the submission of a Development Proposal Application Form and Project Document to the National Directorate for Environment.
101. Relevant environmental assessments will be required to describe the project in more detail and allow NDE to categorize the project. The information to be included with the Project Document and SEIS includes: (i) name of the applicant, and their identifying information and contact details; (ii) location and scale of the project; (iii) plans and

technical drawings of the project; (iv) technical study on the feasibility of the project; (v) details of consultations and opinions or other documents on the project issued by other entities; and, (vii) the application for an environmental license.

102. Pursuant to the Environmental License Law, Public Consultation is not mandatory for Category B of development projects. However, the Proponent (in this case the PMU) is required conduct Public Consultations to meet with the World Bank's safeguards requirements (and in anticipation of the DNCPIA's request). These consultations are aimed to inform affected stakeholders about the project activities and their risks, proposed mitigation measures, including compensation for losses, available avenues to raise grievances and discuss issues and concerns related to the project activities with relevant stakeholders. The Proponent is obliged to implement the EMP in accordance with the provisions of relevant legislation.
103. The GoTL's environmental classifications for environmental permits and environmental regulatory compliance required for Category B for Branch Road Project has been listed in following Table 5.1.

Table 5.1. Environmental Regulatory Compliance

COMPONENT DESCRIPTION			
Sector	Category and Remarks	Scale	Environmental Assessment
Transportation	Category A in accordance with DL5/11		
	V.2 Construction of national and regional roads.	>10km	EIS (ESIA) and ESMP
	Category B in accordance with DL5/11		
	V.1 Rehabilitation of an existing road, excluding community road (including toll roads, bridge crossing, each with two lanes.	All	SEIS (IEE) and EMP
ASSOCIATED ACTIVITIES			
Quarries			
Mining Sector	I.1 Exploitation of minerals (sand and gravel).	<30,000 m ³ /year and >5,000 m ³	SEIS and ESMP
	I.2 Processing and refinement of minerals /quarrying (non-toxic).	<30,000 m ³ /year and >5,000 m ³	SEIS and ESMP
Hot Mix Plant			
	IV.1 p) Other: Plant releasing environmental pollutant, noise, vibration, dust and/or smells, or plant handling flammable and/or hazardous materials (small scale, determined by the environmental authority).	Site <1ha and installation area >3000m ²	SEIS and ESMP

Source: DL5/11 = Decree Law 5/2011 Environmental Licensing, ESMP = Environmental and Social Management Plan, EIS = Environmental Impact Statement, SEIS = Simplified Environmental Impact Statement.

104. According to the Environmental Licence Law, the DNCPIA as Environmental Authority has 30 days, upon receipt of the SEIS, to respond to receipt of the application for an Environmental License for Category B project. The DNCPIA may suspend the review process if additional information is required and has at least 10 days to review the additional information or reject the application. The DNCPIA will establish the conditions and restrictions deemed necessary to protect the environment as part of the environmental license.
105. In term of mineral extraction from quarries and borrow pits, the Ministry of Petroleum and Mineral Resources (MPMR) and National Authority for Petroleum and Minerals (NAPM)

requires contractors to hold a license for mineral extraction from land quarries, borrow pits, and including from rivers. NAPM currently acts under the Licensing of Mineral Extraction, Ministerial Diploma 64/2016.

106. All extraction of construction materials is classed as mining; hence Mineral Operation requires a Mineral License which is issued by NAPM subject to several requirements. The Mineral Operation must provide among other documents: (i) a Mining Plan; (ii) Business Registration documents; (iii) letter of Recommendation from the National Directorate of Land and Property and Cadastral Services (NDLPCS); and (iv) satisfactory compliance with the environmental requirements of DNCPIA.
107. The Secretary of Environment (SE), the Ministry of Petroleum and Mineral Resources (MPMR) and the Ministry of Public Works (MPW), in December 2016, reached an agreement to establish Memorandum of Understanding (MoU) in the process of securing environmental and mineral licenses for the extraction of construction materials to accomplish the desire of the Government to complete the major investments being utilized for the rehabilitation of roads.
108. The Ministry of Petroleum and Mineral Resources through NAPM has agreed to acknowledge the Environmental License issued by SE for the road construction including incidental activities (associated facilities of the quarries, borrow pits, asphalt plant, crushing plant, batching plant/fabrication plant, and other facilities necessary for the road project). MPMR in conjunction with SE through DNCPIA, will further assess and issue acceptance to the Site- Specific Environmental Management Plan (SSEMP) for incidental activities.
109. The Secretary of Environmental will issue the Environmental License for the Simplified Environmental Impact Statement (SEIS) including Environmental Management Plan (EMP). Those were obtained by MPW for road construction and as evidence of compliance with the requirement to mitigate environmental impacts on the road project construction, including the incidental facilities. The Environmental License can be used as evidence of satisfactory compliance with the environmental requirements of DNCPIA and to support the application for Mineral License from National Authority for Petroleum and Minerals.
110. Approval of location has to be received from NAPM, once construction companies have identified a potential source, as the first stage in the Mineral Licensing process. In principle, at this stage, the location can be approved by NAPM for quarry extraction activities. Construction companies must then complete the requirements of the MoU and MD 64/2016 including Mining Plan and a Site-Specific Environmental Management Plan (SSEMP) for each location and gain approval from NAPM to obtain the Mineral License. Construction companies will not be fully authorized without subsequently obtaining the Mineral License. Practically, the Mineral License will be issued subject to documents above being completed, and evidence that DNCPIA gives its endorsement of the mineral extraction activities and associated facilities.

5.2 Land Laws

111. The Constitution Section 141 shown that GoTL concerns to the Resettlement and Land Acquisition which stated that the ownership, use, and development of land as one of the factors for economic production shall be regulated by law. In the Constitution Section 54 covers the right to private property and provides that: (i) every individual has the right to private property and can transfer it during his or her lifetime or on death, in accordance with the law; (ii) private property should not be used to the detriment of its social purpose; (iii) requisitioning and expropriation of property for public purposes shall only take place following fair compensation in accordance with the law and (iv) only national citizens have the right to ownership of land.
112. The first Timor-Leste's land law was promulgated in March 2003 and was designed to serve as an umbrella law for the rest of the land and property regime. The law defined

State property of private domain, established the Directorate of Land, Property and Cadastral Services (DLPCS) as a legal entity and defined its jurisdiction, and articulated general rules concerning land tenure and property rights to be further developed by ensuing legislation. Moreover, this law established a one-year period for both nationals and non-nationals to register their land claims. Effectively Law No. 1/2003 vests all land that belonged to the Portuguese state, and all state property acquired or built by the Indonesian regime, in the new state of Timor-Leste.

113. A Government's decree that issued in February 2011 provides for granting compensation to relocate unlawful occupants of State property based on humanitarian considerations. The Ministry of Justice (MOJ) through Ministerial Statute establishes the basis for calculating compensation. Another decree promulgated in July 2011 provide for the granting of title certificate (private property rights registration) to landowners/persons in areas where cadastral surveys have been completed (following registration and verification of claims by the government) and confirmed that the claims to land are undisputed. Among the claims registered under the Ita Nia Rai program, which has been limited to urban areas, some 92% of claims are undisputed. The Civil Code promulgated in 2011, which came into force in March 2012, includes a section that governs day-to-day land decisions such as the sale and lease of land.
114. The government of Timor-Leste has promulgated the Law No. 8/2017 on Expropriation for Public Development Purposes, and the Law No. 13/2017 on Special Arrangement for Defining Immovable Property in 2017. The substance of Law No. 8/2017 has complemented the Country Constitution of Section 141; states that the ownership, use, and development of land as one of the factors for economic production shall be regulated by law. In parallel, the Law No. 13/2017 on Special Arrangement for Defining Immovable Property has strengthened Section 54 of the Constitution covers the right to private property. Section 54 of the Constitution provides for: Every individual has the right to private property and can transfer it during his or her lifetime or on death, in accordance with the law.
115. Private property should not be used to the detriment of its social purpose. Requisitioning and expropriation of property for public purposes shall only take place following fair compensation in accordance with the law. Only national citizens have the right to ownership of land.
116. The Law No. 8/2017 defines expropriation as any legally admissible restriction to private property or related rights or interests, irrespective of the persons or entities to which they belong. Community immovable property may also be expropriated. Expropriation is only admissible in cases of "public interest" (utilidade pública) in the use of the asset.

5.3 Labour Law and Regulations

117. Specific rules on Occupational, Health and Safety (OHS) are provided in the Timor-Leste Labour Law of 2012. These identify duties of the employer to minimize and mitigate risks, provide safety equipment, inform and train relevant staff and to ensure procedures are in place for work related accidents. A strong control mechanism has been established in 2010 with the creation of the general Labour Inspectorate. It has the power to undertake spot inspection and to issue fines and other sanctions to employers violating Occupational Health and Safety rules. Therefore, during construction the Project will conform to the Health, Safety, and Environmental General Guidelines published by World Bank; unless the local legislation supersedes the international standards.
118. Government of Timor-Leste has signed and ratified several international conventions that are relevant to environmental management such as International Conventions on preserving the natural environment i.e. the United Nations Convention to Combat Desertification (UNCCD; August 2003), the Vienna Convention for the protection of the ozone layer and the Montreal Protocol for the reduction of substances that destroy the

ozone layer, the UN Framework Convention on Climate Change (UNFCCC; Oct. 2006), and the UN Convention for Biodiversity (UNCBD; Oct. 2006).

5.4 Other International Conventions

119. Timor-Leste signed the Kyoto Protocol to the UNFCCC, expressing commitment to reduce global climate change, at the end of 2007. As a result, national programs in land and sea management, biodiversity conservation, climate change adaptation and climate change mitigation (including access to renewable and efficient energy supplies) are being developed.
120. The UN Convention on Biodiversity has specific relevance with SEIS/ESIA, as part of the Branch Road' section passes through environmental sensitivity areas that have identified by Birdlife International as Key Biodiversity Areas (KBA) and Important Bird and Biodiversity Areas (IBAs). It becomes decision-makers guidance that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat. The Convention acknowledges that conservation will bring significant environmental, economic and social benefits in return.

5.5 Gender Based Violence Legal and Policy Framework

121. Timor-Leste has a strong legal, policy and institutional framework to respond to the alarming rates of gender-based violence in the country. Available data show that about one third of women (aged 15-49) have already experienced physical violence since age 15 (by their husband, partner or anyone), with prevalence of 44% in Ermera Municipality (2016 TLDHS). Sexual violence is also widespread: A 2015 study found that 14 percent among all women aged 15 to 49 had been raped by someone other than an intimate partner in their lifetimes (2015 Nabilan Baseline Study). The legal framework includes the criminalization of a number of GBV offences, with heavy imprisonment punishment. Any sexual act with children younger than 14 years old is a serious criminal offence. Rape and other form of sexual abuse are also criminalized. While judicial authorities need improvement on their capacity to deal with sexual offences, an increased accountability for sexual offences is noticeable and generally reported by interested groups.
122. Prevention and redress measures, including survivors' specialized services form part of the institutional and policy framework. State financing of social protection services to women and children victim of violence, while not sufficient, is sizeable. Ministry of Social Solidarity and Inclusion coordinates– a referral network (*rede referál*) where police authorities together with civil society organizations work together at the Municipal level to provide complementary security, social, psychological and legal support to GBV survivors.
123. Within the project-affected construction area in Ainaro and Ermera survivors of GBV have very limited access to locally present social services and legal assistance. Services are located within regional scope, often placed in Suai town in Covalima municipality and in Maliana town in Bobonaro municipality. At the Administrative Post levels there is the presence of low-level social welfare officers to serve as liaison with the referral network service providers and specialized police. A prosecution office in Ermera Municipality capital provides additional criminal investigation support considering that this Municipality has some of the highest prevalence of crimes, including GBV related crimes. Social protection services, in the form of shelters providing psychosocial and medical support, and legal support to survivors are only existent in Suai, with those residing in Ainaro Municipality accessing Suai based services and those in Ermera travelling to the country's capital Dili.'

5.6 Social Assessments and Indigenous Peoples

124. There are ethnic groups in Timor-Leste, but the legal regime does not use the term

- ‘indigenous peoples’, nor does it appear to use ‘ethnic minority’ or ‘ethnic group’ or any other term to signify cultural identification with any of those groups.
125. Constitution 2002 Section 2 (Sovereignty and Constitutionality) stipulates that the State shall recognize and value the norms and customs (or hereafter known as Tara Bandu) of East Timor that are not contrary to the Constitution and to any legislation dealing specifically with customary law. Tara Bandu generally refers a traditional Timorese custom that enforces peace and recognition through the power of public agreement to define social norms and practices to a given community. The process of forming Tara Bandu represents a process of coming to communal agreement or ‘social contract’ that outlines the behaviors and practices that members of the community deem to be appropriate and want to enforce. As such the legitimacy of the Tara Bandu is largely dependent on the degree of local level consultation and engagement in the generation of the terms of such communal accord.
126. Basic Environment Law 2012 Article 8 contains relevant provisions on Tara Bandu, which stipulates that:
- a. the State shall recognize the importance of all types of Tara Bandu as integral part of the culture of Timor-Leste and accepted traditional mechanisms regulating relationships between people and the environment around them;
 - b. Tara Bandu can be carried out according to the rituals preserved through the local customary law aiming at the preservation and promotion of environment and conservation and sustainable use of natural resources, provided that such action is consistent with the objectives and principles established by the law;
 - c. The state must ensure effective protection of the Tara Bandu;
127. The Environmental Licensing Law 2011 does not contain explicit requirements for screening processes to determine whether affected community groups are Indigenous and the nature of impacts on them. Community consultations are required at the design stage only.
128. While consultations and more robust social impact assessments are generally prescribed for projects classified as Category A, risk categorization tends to favor environmental impacts and is often informed by environmental footprints of the projects. This suggests that social impact assessments often follow environmental assessments, which is not necessarily the case and projects with lower categories (Category B and C) are often exempted from such requirements.
129. The Basic Environment Law 2012 Article 47 stipulates provisions on access and distribution of benefits which further define forms of sharing and equitable distribution of tangible and intangible benefits arising from the projects or use of environmental and natural resources for the communities located in the same area of the project’s footprints. Depending on the process to reach benefit sharing agreements, such negotiation may provide affected communities with the opportunity to actively participate in the project development and overall design. However, such provisions tend to be applicable for Category A projects. In addition, the scope of such negotiation does not include consent requirements for commercial development of cultural resources and traditional knowledge.
130. The Basic Environment Law 2012 guarantees access to environmental information, including information about potential project impacts on public health and human welfare. The Environmental Licensing Decree-Law 2011 requires public consultation on an EMP. However, there is no explicit requirement in the legal regime to disclose a draft EMP and there is no requirement whatsoever to disclose an EMP for a Category B project.

5.7 Safeguard Guidelines

131. In addition to comply with country safeguards the Project will also need to comply with

World Bank's OP 4.01 – Environmental Assessment, 4.04 – Natural Habitats, 4.11 – Physical Cultural Resources, 4.10 – Indigenous Peoples, and 4.12 – Involuntary Resettlement; which sets out the policies and principles for protecting the environment and people by wherever possible avoiding impacts and mitigating and/or compensating for impacts that cannot be avoided. Furthermore, people should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.

132. The solutions required to ensure resettlement has the following outcomes, including a) consultations with project affected about people viable solutions for resettlement, compensation and livelihood restoration; b) providing affected people options of resettlement and livelihood restoration; c) Compensating entire replacement cost for damages and loss; d) Selecting sites for resettlement where shall provide minimum benefits and services similar to their existing place ; e) Providing finance for assistance, training, and income support to help them go well during the transitional period; f) Recognizing vulnerable groups and providing special support for these groups; and g) Establishing a structure on institution and organization to assist this process to finally succeed.

5.8 World Bank Policy

133. Under sub project component 1.1, the project will finance the rehabilitation of branch roads. It is expected that the impacts would be local, reversible and readily managed with proven or standardized mitigation measures. An ESIA and ESMP to manage and mitigate such impacts in accordance with OP 4.01 have been prepared. The assessment of potential impact should also consider the social community or social living of the resident around the project location.
134. OP 4.04 Natural Habitats outlines the World Bank policy on biodiversity conservation taking into account ecosystem services and natural resource management and those used by project affected people (PAP). Projects must assess potential impacts on biodiversity. The policy strictly limits circumstances under which damage to natural habitats can occur and prohibits projects that likely result in significant conversion or degradation of critical natural habitats. Impacts were assessed in the ESIA process.
135. OP 4.11 Physical Cultural Resources (PCR) sets out World Bank requirements to avoid or mitigate adverse impacts resulting from project development on physical cultural resources. The ESMP includes the requirements for preparing chance finds procedure.
136. OP 4.10 Indigenous Peoples. This policy requires the Government to engage in a process of free, prior and informed consultations with indigenous peoples, as described by the policy in situations where indigenous peoples are present in, or have collective attachment to, the project area and for the preparation of an Indigenous Peoples Plan (IPP) and/or Indigenous Peoples Planning Framework (IPPF). The objectives of the policy are that broad community support from Indigenous Peoples in the project area should be obtained and that the policy aims to minimise impacts and provide culturally appropriate benefits and mitigation measures.
137. Basic principles under OP 4.12 of the World Bank on Involuntary Resettlement, for any project, a resettlement plan must be prepared to ensure that:
- Involuntary resettlement must be avoided where possible, or be reduced to the lowest possible extent by selecting appropriate design options;
 - Where involuntary resettlement is unavoidable, the resettlement activities must be prepared and executed with sustainable development programs and sufficiently provided investment supports, enabling displaced people to benefit from the subproject. The displaced people will be fully consulted and allowed to participate in preparing and implementing activities in the Resettlement Plan;
 - The displaced people must be supported in terms of their capacity to improve their living conditions and to rehabilitate their living standards at least equal to that before

constructing the subproject, equal to the actual present value to the level before displacement or to a common level before the commencement of the project or even higher than that.

5.9 Contractual Obligations

138. The Contractor should follow standard construction practices and comply with contractual requirements which will be monitored and supervised by the Project Management Unit.
139. The selected Contractor as the main contractor will be responsible for the compliance of all Sub-contractors with the Contract and Environmental Licence by implementing the Environmental and Social Management Plan (ESMP). The Contractor will assist the Project Implementation and Supervision Consultant – PISC and shall monitor compliance of the ESMP implementation. With the assistance of the PISC's Engineer, the Project Management Unit/MPW will monitor compliance of the ESMP implementation by the Contractor.
140. The Contractor will be required to confirm that they have carefully considered the requirements for environmental management contained in the updated Construction ESMP when preparing the bid and pricing the items of work.
141. The Contractor should accept that the prescribed mitigation measures and clauses detailed in the ESMP are an integral part of the specifications for relevant items of work. Unless separate items are included in the Bill of Quantities (BoQ), the Contractor will accept that separate payments will not be made in respect to compliance with the ESMP.
142. In case the Contractor or Sub-contractors fail to implement the ESMP recommendations, the Proponent shall take necessary action(s) to ensure that the ESMP is properly implemented and/or to rectify the damages caused by such negligence.
143. The Contractor will be required to provide the human and financial resources necessary to progress and achieve statutory compliance and implementation of the Contract and the ESMP. The Contractor will conform with contract procedures and specifications and implementation of the ESMP during construction and maintenance and PMU will monitor them carefully. The Contractor shall assist the PISC's Engineer to carry out his/her duties as required in the ESMP implementation which shall include but not necessarily be limited to the following:
 - Maintaining up to date records on actions taken by the Contractor regarding the implementation of ESMP requirements;
 - Timely submission of reports, information, and data;
 - Participation in the meetings convened by the PISC, and
 - Any other assistance requested by the PISC.
144. The Contractor will provide monthly monitoring report within 10 days of the following month to the PMU/PISC, relative to the implementation of the requirements contained in the ESMP and the results of the environmental performance monitoring.

NOTE:

All the application processes for securing the licenses for quarry activity and its associated facilities to support the road project implementation must follow the requirements under the Law.

6. Description of the Environment

6.1 Physical Environmental Conditions

A. Climate

144. The FAO describes the climate of Timor-Leste as characterized by extreme conditions where the northern part receives little or no rain for almost eight months of the year. The island's climate is dominated by the monsoon season. The rainy season comes in with the northwest to southwest winds that prevail from December to March.
145. The rest of the year is usually dry as the southeast to northeast winds prevail, except at the south coast and the southern slopes where the wet season generally persists until July. Average annual rainfall is around 500 mm, extremely heavy rainfall occasionally occurs in Timor- Leste during relatively short time intervals.
146. The average monthly temperature and rainfall for Timor-Leste from 1991 to 2015 based can be found at the link indicated in Figure 5.1.

Figure 6.1: Rainfall and temperature 1991 – 2015 in Timor Leste

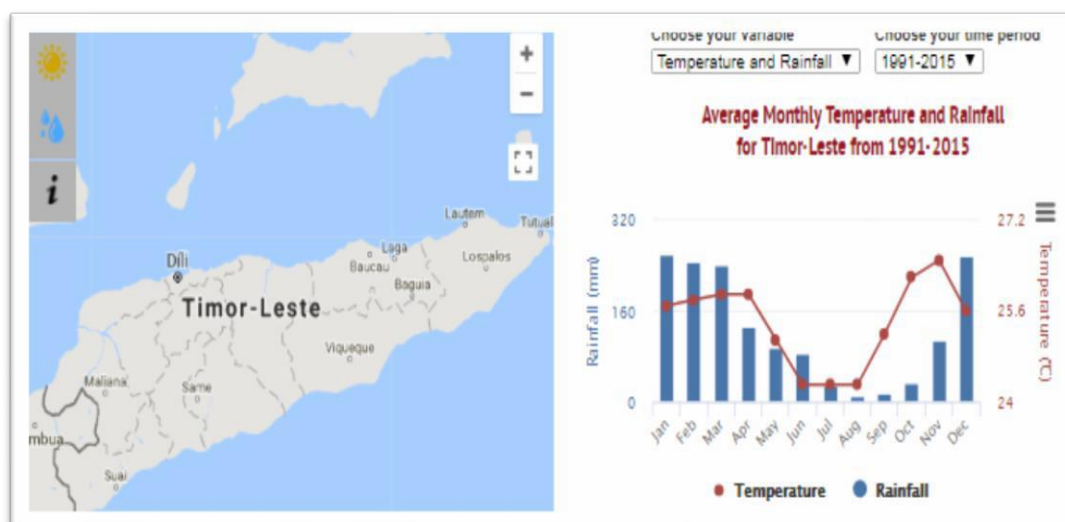


Figure 6.2: Rainfall and temperature 1991 – 2015 in Aituto

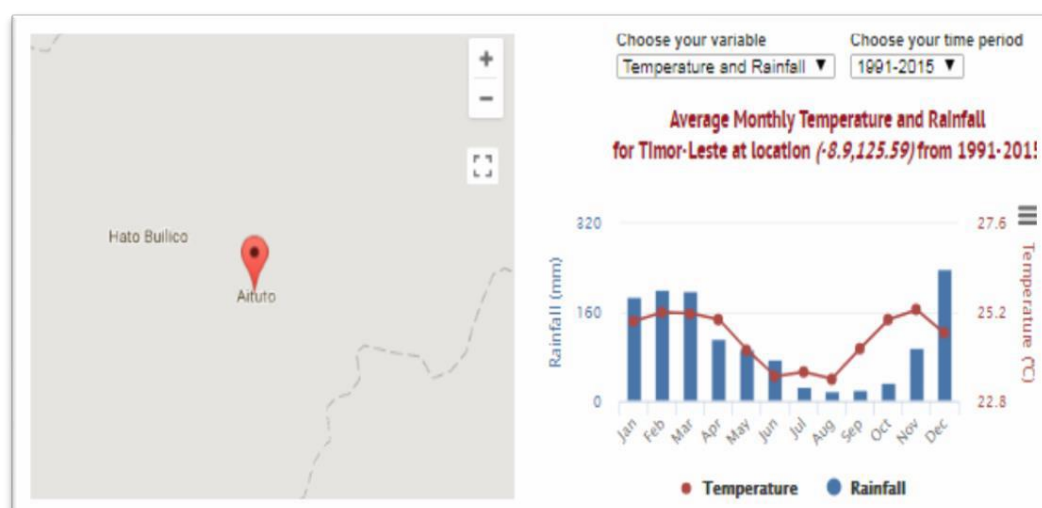


Figure 6.3: Rainfall and temperature 1991 – 2015 in Hatubuilico

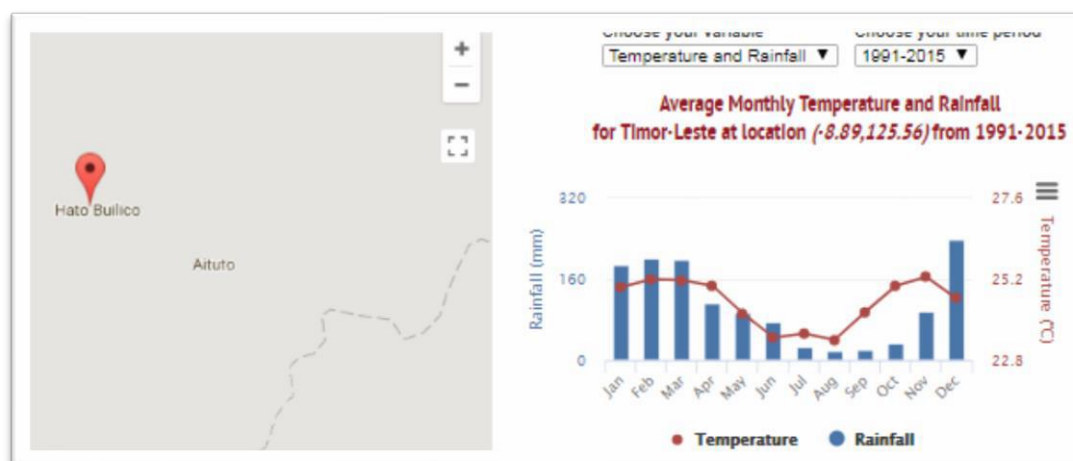


Figure 6.4: Rainfall and temperature 1991 – 2015 in Letefoho

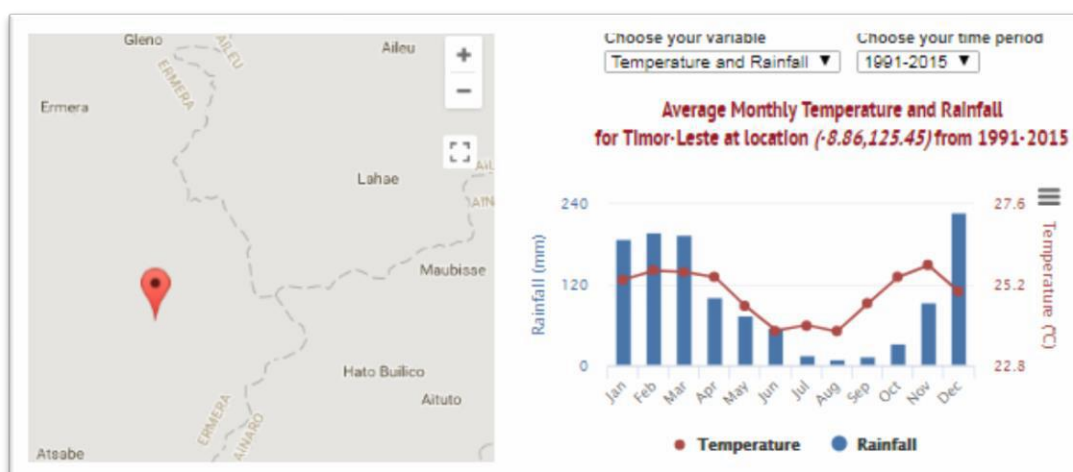
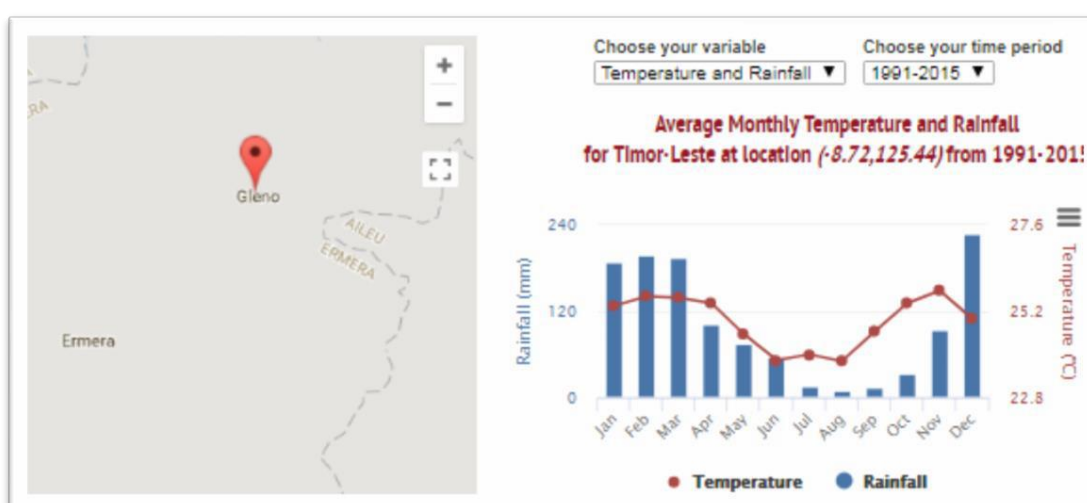


Figure 6.5: Rainfall and temperature 1991 – 2015 in Gleno



147. Typical of the tropic region, Timor-Leste experiences little temperature variation within a day or during different seasons. Relatively more significant temperature variations occur with altitude. Relative humidity varies between 70 and 80%, which makes the climate humid in general (MAFF, 2004).
148. The calendar of climate and rain-related hazards for Timor-Leste are shown in Figure 6.6. Such hazards shall be considered during construction.

Figure 6.6: WFP Hazard Calendar (cited in ADPC, 2013)



Source: SEIS, RNUP-AF District Road C-17 Ai Pelu to Bazartete, 2018

149. Tropical cyclones are among the natural hazards that occur near Timor-Leste. The formation of tropical cyclones generally occurs within a band between 5° and 25° from the equator and these bring exceptionally high rains and winds. In the past, they occasionally develop in the Banda, Arafura, Timor and Sawu seas, especially during April and May and move in a south- westerly direction. It is estimated that on average tropical cyclones occur over the Timor-Leste region about once in every 5 years.

B. Air Quality

150. Outdoor air pollution in Timor-Leste is not currently a problem. The ambient air quality concerns are limited to Dili. However, there are some areas near Dili where air pollution is excessive. There is rapid growth in the urban population and on-going economic development in the country. Dili already accounts for 20 % of the country's total population.
151. Smoke from domestic cooking in villages is another cause of local pollution however these fumes are generally well dispersed although they can accumulate indoors if cooking areas are not well ventilated.
152. Dust is a concern in the study area where the road has little remaining of the original macadam paving. Dust is an also concern in sections where remainders of slide materials cover the road and where pavements are covered or deteriorated. This is particularly a problem during the dry season.

C. Noise

153. The Project corridor is generally rural in character with low traffic volume and noise from motorized vehicles is intermittent and not a concern at the moment. Construction noise has generally not been a problem with the construction of other road sections as the works are intermittent and construction methods will be similar. The UNTAET guideline on ambient noise was introduced in 2002 for Timor-Leste is Leq55 dB(A) (day time) and Leq45 dB(A) (night time) for residential sensitive receivers and is the same as for World Bank. The World Bank standard applies an ambient criterion of Leq55 dB(A) for residential areas, hospitals, and schools. Where the background exceeds the ambient

standards the criterion is background +3dB(A).

154. According to observation in the settlements and towns where traffic is intermittent throughout the day, the criterion of $Leq55$ dB(A) for residential, school and hospital sensitive receivers are potentially exceeded at sometimes. As the criteria are potentially exceeded at sometimes of the day, hence is recommended that to make a consistent assessment for all locations the existing criterion of background +3dB(A) will be applied in the assessment for both daytime and nighttime.

D. Topography

155. The Timor-Leste's landscape is dominated by mountain ranges which cover about 1/3 of the country's land area (UNESCAP, 2003). It is estimated that more than 40% of the land in Timor Leste has more than 40% slope (MOI, 2009). One prominent mountain range is the Ramelau Range; highest elevation 3,037 m above sea level (asl) at Tatamailau.
156. This steep topography is present as part of the Project, as road Project of Aituto – Gleno is one of the north-south connectors across the mountainous ridge along the foot of Mt. Ramelau. In the first section, it starts from the south and road rises, then falls and sometimes winds up/down mountainous slope, with an altitude of a maximum of 2,160 m from Aituto to Hatubuilico.
157. Continuation to the next section, the road runs through a conical slope at the highest elevation $\pm 2,300$ m asl to Mt. Tukaro, was a hilly terrain and ridge (Eratoi – Labululi, Letefoho – Subelu) i.e. from Hatubuilico to Letefoho. Subsequently, after going to the mountainous area, turn down the third section will include the flat area from Kukhata to Goulolo, and the road reaches the Greno City, about 700 meters above sea level.
158. Given the mountainous terrain of the Project corridor, one of the challenges of the rehabilitation work is the identification of spoil disposal sites. No tipping shall be allowed on the steep slopes without establishing the engineering safety and obtaining permission from the authorities, PMU, and landowners (if any).

Figure 6.7: Bathymetry and Topography of Timor Leste

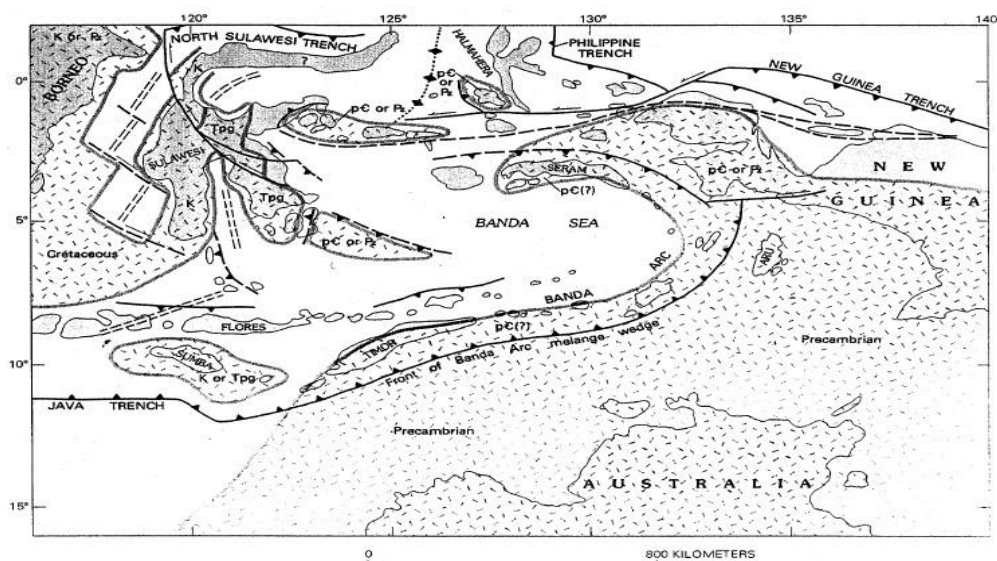


Source: National Ecological Gap Assessment (NEGA), 2010.

E. Geology

159. Geologically, Timor is part of Banda Arc, which was formed by a complex subduction setting present as in following Figure 6.8.

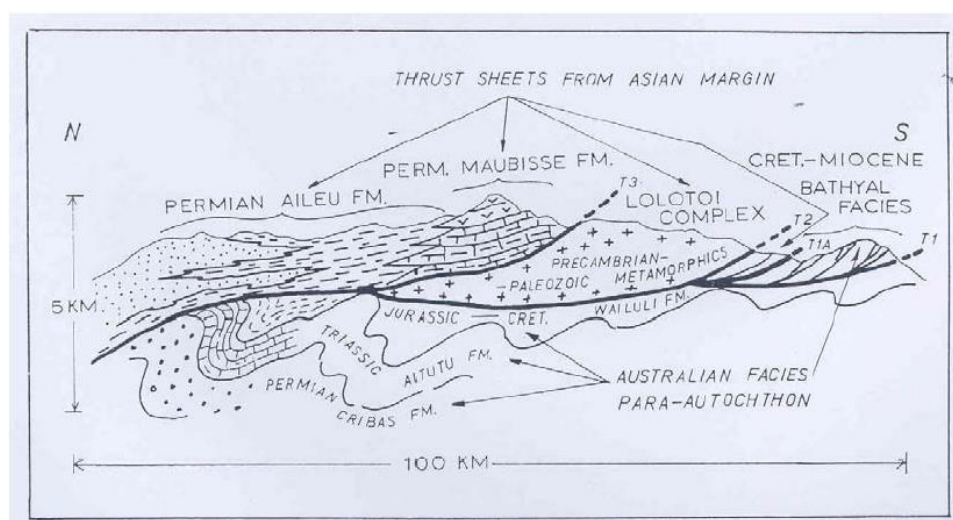
Figure 6.8: Distribution of the Two Major Rock Types in Timor Area



Source: KEI, Feasibility Study 2018

160. Timor Island is located in an active tectonic region, where subduction of the Australian plate beneath the Eurasian plate is taking place. The formation of Timor Island is related to this subduction. The top layer of the subducting plate is scraped and accreted with the accretion probably taking place from approximately 10 million years ago (mya) to ± 3 million years ago (Late Miocene and Early Pliocene). As the accretionary wedge thickened, it continued to be uplifted throughout to Pliocene and Pleistocene (3 mya to ± 0.3 mya) reaching heights of over 3,000 meters above the sea level in some places.
161. The Timor trough is running parallel to the southern coast of Timor Island, while the northern edge of Timor is an extension of Australia continental crust. The collision began in the late Miocene, ± 11.6 to 5.3 million years ago. Timor has older geology and lacks the volcanic nature of the northern Lesser Sunda Islands. Timor Island built up with contributions from the Australian continental plate, the mélangé, and the ophiolitic Banda terrain (see Figure 6.9).

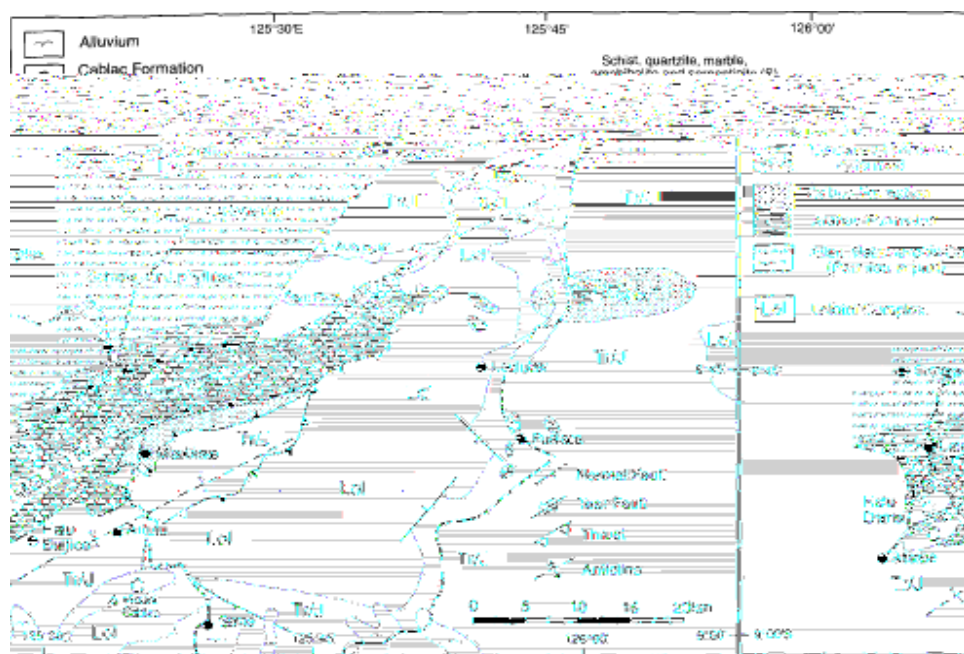
Figure 6.9: Schematic Stratigraphic Profile through Timor



Source: KEI, Feasibility Study 2018

162. Given the island is the tectonic origin, the rocks that formed Timor Island are of continental origin (Australian origin), metamorphosed marine sediments (mélange) and rocks associated with the oceanic crust, collectively referred to as ophiolite. One suite of metamorphic rocks referred to as the Aileu Formation occurs widely in the northern part of central Timor. The Aileu Formation consists of a series of shales, phyllites, slates, and occasional low-grade metamorphosed eruptive rocks. This formation has been repeatedly exposed to deformation especially on the north coast. This deformation including the pervasive presence of platy minerals such as chlorite and mica structurally weakens the rock.
163. In this area, the geological basement consists of the Permian Aileu Formation and Maubisse Formation which has been thrust over the older Formations, Permian Cribas FM, Triassic Aitutu FM, and Jurassic-Cret. Wailuli FM (see Figure 6.10). The boundary between Aileu FM and the Maubisse FM north of Maubisse was interpreted as a thrust, with the Aileu meta- morphic structurally overlying the Maubisse block.

Figure 6.10: Type Area for the Permian Units in Timor-Leste



Source: KEI, Feasibility Study 2018

164. Aileu Formation is composed mostly of weak metamorphosed argillaceous rocks (pelites) and arenaceous rocks (psammities), with local occurrences of carbonate and igneous bodies of the Permian to Jurassic age. The common unit is slightly metamorphosed to sub-greenschist facies except along the north coast.
165. The limestone of Maubisse Formation is widespread in Timor-Leste. The limestone is well bedded and consists of dense beds and massive reef. They are colored red, pink, white and gray. The fauna is rich, especially in the reef facies. Conglomerates contain clasts of eruptive rocks and stuff. A sequence of 500 meters of basalt is found on Mt. Ramelau. The environment of deposition was shallow marine in warm water.
166. From the geological engineering points of view, it is important to issue, how dip and strike are the schistosity and joints of the metamorphic rock mass and how degrees of weathering affect its rock mass for slope stability and construction practice. The geology of the road alignment based on exposed rocks along road cuts is mostly metamorphic rocks belonging to the Aileu metamorphics and recent colluvial deposits. The colluvium deposit is an accumulation in depressions/gullies of eroded materials from adjoining

slopes consists of angular rock fragments ranging from gravel size to boulder size with soil and clay. This deposit is stable when dry but weakens with the presence of water as it is prone to debris flow and slippage. Typical of slopes shown in the following Figure 6.11.

167. The stability of the rock formation along the cut slopes of the Project corridor can be a source of potential adverse impacts during the rehabilitation and construction work. Spoils from slope trimming that will be suitable for fill materials will need to dispose of. Threats of the landslide will be present, and this is a safety concern for workers and people using the road.

Figure 6.11: Typical appearance of slopes at the Project site



168. During the operations stage, rock falls, slides and debris flow are going to be major concerns as these will affect roads and drainage. Road clearing of slide materials will continue during maintenance work, especially during the rainy season. Aside from obstruction, the other source of indirect impacts of road clearing is the disposal of the landslide materials which could be significant in the event of a major landslide event. The identified critical sites are shown in Table 6.1.

Table 6.1. Identified Critical Sites

SYNOPTICALLY TABLE ON THIRTY-FIVE CRITICAL SITES								
No.	STA	Critical Items	α	Width (m)	Length (m)	Depth (m)	REMARKS	
Sec 1	1	0+620	Landslide				Landslide not yet improved	
	2	0+900	Slope Failure	40°	15	20	3	New landslide
	3	1+760	Landslide	10°	35	60	8	Landslide not yet improved
	4	2+540	Slope Failure	40°	5	15	1	Slope failure not yet improved
	5	2+800	Slope Failure	45°	7	10	0.5	Slope failure not yet improved
	6	3+300	Slope Failure	45°	5	8	1	Slope failure not yet improved
	7	4+600	Landslide	20°	36	20	4	The landslide informed by community
	8	8+600	Landslide					Landslide not yet improved
	9	9+300	Landslide	20°	15	30	1.5	Landslide not yet improved
	10	9+400	Slope Failure	50°	40	50	5	Slope failure not yet improved
	11	9+800	Slope Failure Talus	5°	3	5	0.5	Slope failure talus not yet improved
	12	10+600	Slope Failure	50°	40	50	5	Slope failure not yet improved
	13	11+300	Slope Failure	45°	5	3	0.5	Slope failure not yet improved

SYNOPTICALLY TABLE ON THIRTY-FIVE CRITICAL SITES									
No.		STA	Critical Items	α	Width (m)	Length (m)	Depth (m)	REMARKS	
				45 ⁰	3	4	1		
				45 ⁰	3	9	1		
				45 ⁰	5	5	1		
Sec 2	14	17+540	Slope Failure					Slope failure not yet improved	
	15	17+580	Slope Failures (old road broke)					Slope failure not yet improved	
	16	20+300	Slope Failure	40 ⁰	4	13	1	Slope failure not yet improved	
	17	22+300	Slope Failure (chair type)	10 ⁰	8	20	4	Slope failure not yet improved	
	18	27+200	Big Landslide	30 ⁰	200	100	50	Big landslide not yet improved	
	19	27+300	Big Landslide	15 ⁰	500	200	50	Big landslide not yet improved	
	20	28+300	Slope Failure (old)	40 ⁰	50	30	3	Slope failure not yet improved	
	21	28+400	Landslide	10 ⁰	20	10	4	Landslide informed by the chief of Ducurai suco	
	22	28+500	Landslide	30 ⁰	35	30	5	a landslide between the school building and project road	
	23	31+400	Landslide					Landslide not yet improved	
	24	34+600	Slope Failure	40 ⁰	30	20	5	Slope failure not yet improved	
Sec 3	25	34+700	Slope Failure	40 ⁰	15	8	5	Slope failure not yet improved	
	26	35+000	Slope Failure	80 ⁰	5	4	0.5	Slope failure not yet improved	
	27	35+700	Prone to Landslide	45 ⁰	30	20	5	It may impact <i>uma Lulik</i> and cultural site	
	28	38+800	Slope Failure	20 ⁰	2	1.5	0.5	Has improved (built retaining wall)	
	29	39+000	Landslide (old)	30 ⁰	20	40	5	Has improved (built retaining wall)	
	30	39+600	Slope Failure	50 ⁰	5	20	4	Has improved (built retaining wall)	
	31	40+100	Day light					Has improved (built a retaining wall)	
	32	40+700	Slope Failure at several sites	60 ⁰					Has improved (built a retaining wall)
	33	41+400	Slope Failure	40 ⁰	4	13	0.5	Has improved (built retaining wall)	
	34	55+500	Slope Failure (shoulder)	80 ⁰	20	5	5	Slope failure not yet improved	
	35	56+700	Slope Failure (shoulder)	10 ⁰	20	5	1.5	Slope failure not yet improved	

Source: KEI, Feasibility Study 2018

F. Erosion and Sedimentation

169. The inherent weakness of the rocks, the steep terrain and the occurrence of intense rainfall make erosion and sedimentation very active geologic processes in the northern parts of Timor-Leste. Erosion and sedimentation in this part of the country consist of both the slow erosion deposition and rapid mass wasting processes which include debris flow, rock falls and landslides. After completion of the Project corridor and adjacent projects, the occurrence of the landslide is expected to be minimized.
170. Since the road improvements require widening, three (3) measure works are to be considered: (i) cutting in mountain-side slope; (ii) filling in valley ward slope, and (iii) both works. In addition, the countermeasures for the potential landslides, which consist of a landslide, slope failure, and debris flow shall be considered.
171. Filling: the existing road sections have two types of damage: (i) deformed retaining wall (stone masonry and gabions) and (ii) landslide. In order to circumvent the problem on the retaining wall, adequate compaction on the soil materials as desirable backfill, and considering sufficient safety factors in the design for overturning, sliding, and bearing capacity are required. The adequate load-bearing layer is necessary during construction.
172. Debris Flow: debris on the road run along the mountain ridge and through the flat hill, the potential debris flow is low to small catchment areas from the intersection of road and torrent. If there is a flow of debris in the area, the return period of occurrence is probably over 100 years, hence, countermeasures are not indispensable because it is not of high risk. However, debris flows have cascaded in few places, and it needs adequate countermeasure for those road crossing structures, to have enough capacity taking into account the debris flow.
173. Cutting: many artificial cut slopes exist along the entire length of the project road. These existences are of various conditions, i.e. geomorphology, geology, weathering, and soil, with various shapes, i.e. height, width and inclination, and also in different time.
174. There is the activity of road widening on the Road Section 1 and 2, which will involve extensive cut and fills especially in Section 1. The extensive cutting will generate excavation' spoil $\pm 1,184,000$ cubic meters (cu.m), whereas the backfilling only needs 208,450 cubic meters. Hence, there is a high volume of spoil $\pm 1,054,900$ cubic meter that requires suitable sites to be designated as a material disposal area. The potential sites proposed as disposal area can be seen in Appendix 4.
175. High sedimentation rate of the rivers within the northern part of Timor-Leste is quite obvious. This is indicated by the presence of uplifted river alluvial terraces and wide alluvial filled river channels, from the lower reaches to the headwater sections. The high sedimentation rate causes a river bed to aggrade and lead to a reduction of the river's bank full capacity. As a consequence, banks are overtopped, and flooding and river channel migration take place.

DESCRIPTION	UNIT	Section -1	Section - 2	TOTAL
Volume of Slope Cutting				
Surplus common excavation	cu.m	236,100	227,500	463,600
Surplus hard rock excavation	cu.m	123,600	22,700	146,300
Surplus soft rock excavation	cu.m	239,400	205,600	445,000
Volume of Back Filling				

Embankment from roadway excavation (common materials)	cu.m	47,200	81,900	129,100
Embankment from selected borrow pits (granular materials)	cu.m	18,275	61,075	79,350

G. Quarry Resources

144. Some of the quarry resources exist within a few kilometers of the Project corridor, and among these are the nearest river beds located about 2 km from the endpoint - Gleno. Removal of river materials through quarrying will help in restoring the bank full capacities of the rivers when exploration is not over capacity.
145. The river within the Project corridor section may be used as a source of quarry materials, as rivers are a common source of construction materials in Timor. Furthermore, the material engineers have indicated seven borrow pits located between section 2 and 3 that potential for material sources (see table below). In addition, some locations of the material resources have been informed by the community during the Public Consultation Meeting, that needs to be checked further. However, materials resources should be located and obtained under the licensing procedures of the Government of Timor-Leste based on the Ministerial Diploma No. 64/2016.

No	LOCATION (STA)	EASTING	NORTHING	ELEVATION (M)	DISTANCE FROM MAIN ROAD (M)	ESTIMATE QUANTITY (M³)	REMARK
1	1 + 600	783,857.84	9,717,988.47	1,967.345	32	22,500	CP-1
2	3 + 500	782,719.11	9,017,340.55	2,062.321	3.0	4,800	CP-1
3	9 + 520	779,860.76	9,016,733.89	2,090.432	50	10,000	CP-1
4	9 + 820	779,670.68	9,017,278.24	2,108.234	5.0	19,200	CP-1
5	35 + 700 (Hatoe river) down stream	768,058.53	9,034,201.82	1,255.471	25	4,000	CP-2
6	39 + 100 (Karau Ulun Goulolo river) down Stream	767,258.14	9,026,014.12	1,186.85	20	5,000	CP-2
7	40 + 740 (Raicala river) down stream	768,173.97	9,027,251.73	1,214.68	15	7,000	CP-2
8	44 + 000	769,238.6	9,029,879.76	1,214.68	60	4,000	CP-2
9	CICO Quarry (Maubisse)	785,241	9,015,550				CP-1
10	Gleno River/down stream	767,241.84	9,034,271.81	714.234	700	13,000	CP-3

146. The application processes for securing the licenses for quarrying activity and its associated facilities to support the road project implementation must follow the requirements under the Law. Locations for quarry extraction activities to companies will not be authorized without first securing location approval from the NAPM. Subsequently, completing and obtaining approval of the Site-Specific Environmental Management Plan and Mining Plan and following the requirements of the NDPCEI such as the Environmental Licensing Law for each location.

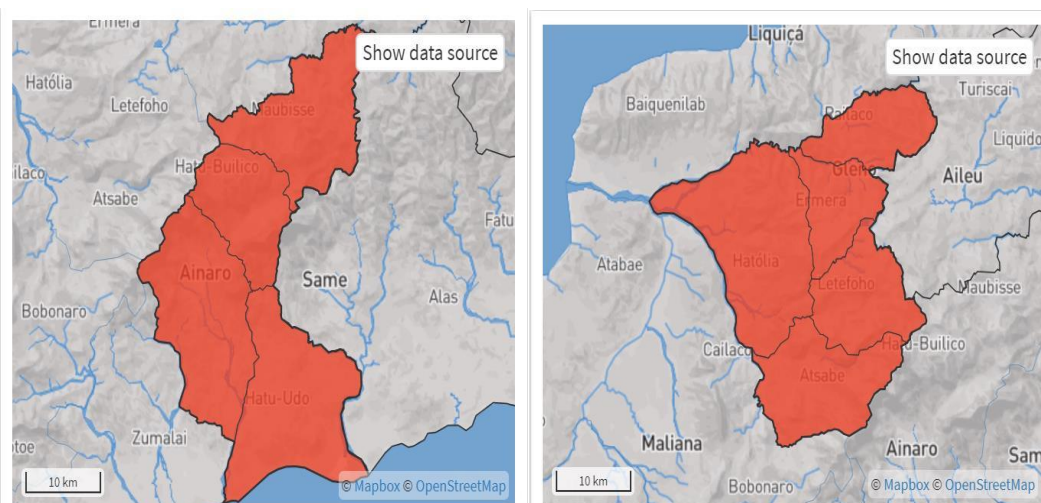
H. Seismicity

147. Timor Island is prone to earthquakes, due to located in a tectonically active region along the collision zone of the Australian plate and the Eurasian Plate. Earthquake-related hazards (e.g. severe shaking, Tsunami, ground subsidence) are among the

threats to Timor-Leste. According to the compilation of major shallow earthquakes in Indonesia from 1897 to 1984 by the Southeast Asia Association of Seismology and Earthquake Engineering (SEASEE, 1985), those showed a number of earthquakes with epicenters located offshore north of Timor Island.

148. Timor-Leste's combination of seismic risks, heavy monsoonal rain, high winds, steep topography and prevalent deforestation that impact prone to floods, landslides, river shifts, and erosion. Rural communities face various hazards affecting agricultural livelihoods such as crop and animal diseases and pest infestation. Urban areas are unprepared for possible disasters ranging from disease outbreaks, fires, chemical spills and sewage runoff (UNDP 2010, WFP 2006).
149. While Timor-Leste has a medium exposure to hazards, its lack of coping and adaptive strategies makes it the 7th most disaster-prone country in the world (UN WRI 2011). Earthquake hazard in Ainaro and its surrounding, including Ermera municipalities, is classified as medium (see Figure 5.11), means that there is a 10% chance of potentially-damaging earthquake shaking in the Project area (GFDRR, 2018).

Figure 6.12: Medium Earthquake Hazard in Ainaro and Ermera Municipalities



Source: Global Facility for Disaster Reduction and Recovery (GFDRR), 2018

150. The impact of the earthquake should be considered in all phases of the Project, in particular during design and construction. Project planning decisions, project design, and construction methods should take into account the level of earthquake hazard. Further detailed information should be obtained to adequately account for the level of hazard.

I. Water Resources

151. From the geographical condition of Timor-Leste, this country is a relatively desiccated country with an unstable balance, between dry season and wet season, the dry season is relatively longer than the wet season. This is also separated by the general condition of Timor-Leste geology which is formed from karst rocks which are porous in nature. The ability of the soil to hold water is very low a phenomenon which can be observed from the shriveled rivers in the dry season and the flooding in the rainy season.
152. Timor-Leste has been broadly divided into 12 Hydrologic Units, which are groupings of climatologically and physiographically similar and adjacent river basins. Each of these hydrologic units comprises a number of rivers, 29 main river systems in total, of which 12 in the north and 17 in the south. All rivers are generally short and fast-flowing (AWRF, 2006). Table 6.2. presents the units with the corresponding area in the country.

Table 6.2. Hydrologic Units in Timor-Leste

Name of unit	Area (km ²)	As % of country
Loes	2 184	14.7
Laclo	2 024	13.6
Clere and Belulic	1 917	12.9
Irabere	1 614	10.9
Mola and Tafara	1 533	10.3
Seical	1 510	10.2
Tukan and Sahen	1 375	9.2
Laleia	1 006	6.8
Lifau and Tono Besi	812	5.5
Vero	744	5.0
Atauro Island	140	0.9
Jaco Island	11	0.1
Total	14 870	100.0

153. The largest river system is Loes river system with a total area of 2,184 km² (almost 15 % of the country), which is also the longest river (80 km). Subsequently, followed by the Laclo river system with 2,024 km² as well the Clere and Belulic river system by 1,917 km². Given the temporal variations in rainfall and the low capacity of upland areas to hold water, very few rivers flow all year round, most being ephemeral but generally with significant underflows in the lower reaches (FAO - Water Report 37, 2012).
154. Internal renewable surface water resources $\pm$ 8.129 km³/year and groundwater resources at 0.886 km³/year. There is estimation 0.8 km³/year or 90 % returns to the rivers as base flow and may be considered to be the overlap between surface water and groundwater. Therefore, total internal renewable water resources (IRWR) are estimated at 8.215 km³/year. Furthermore, the sustainable yield of the aquifers, which can be considered to be the exploitable groundwater, is around 0.266 km³/year (FAO - Water Report 37, 2012).
155. Some river basins are shared with Indonesia in the border area and Oecussi Municipality. There about 9 % of the Loes river basin, 20 % of the Tono river basin, and 60 % of the Noel Besi river basin lie in Indonesia, the latter two being in Oecussi Municipality. However, no information on the amount of water crossing the borders is available. In addition, there are several water resources that can be potentially used on a large scale in municipalities of Manatuto and Aileu where the watershed contains a fairly spacious catchment area, which results in relatively high-water availability. In these regions, multipurpose dams could be built to fulfill raw water and electricity (hydropower) needs.
156. Timor-Leste has only one large freshwater lake i.e. Lake Ira Lalaru, which formed in the lowest part of the Fuiloro plateau, it covers 10 up to 55 km² depending on the season. Lake Ira Lalaru has a catchment area of 406 km², but apart from very heavy rainfall events the catchment characteristically produces little runoff as the lake is situated in a limestone karstic area. While several small watercourses drain into the lake none of these are perennial (AWRF, 2006).

J. Flooding

144. Flooding in Timor-Leste occurs as flash-flooding when heavy seasonal rains in high catchment basins converge in tributaries as they descend, resulting in a rapid rise of discharge in the water courses (UNDP 2010). La Nina, which brings heavy rainfall, causes an increase in floods. According to the data from National Disaster Management Directorate (NDMD), the number of floods has increased since 2010. From 2001 to 2009, NDMD recorded 32 floods, a number which has increased to 185

since 2010.

145. Mainly there are two types of floods i.e. riverine flood and flash floods. The main causative factors of flooding in Timor-Leste include heavy rains; rapid excessive runoff from the slopes to streams; and high mountainous ranges having steep slopes and low soil permeability (WB, 2015). Based on the return-period flows, a maximum flood depth of 3.9 meters was estimated for a 100-year return period event for suco Talitu of Aileu Municipality.
146. An experience of the urban flood hazard in Ermera District is classified as high based on modeled flood information provided by GFDRR. This means that potentially damaging and life- threatening urban floods are expected to occur at least once in the next 10 years. Project planning decisions, project design, and construction methods must take into account the level of urban flood hazard. (GFDRR, 2018).
147. As reported on Build Disaster in Timor-Leste (WB, 2015), informed some findings that area of Letefoho Administrative Post, Riheu and Poetete Sucos (within Ermera Administrative Post), and Ainaro Administrative Post are the most flood-affected area. Subsequently, in terms of the residential sector, Letefoho Administrative Post registers an average annual loss of USD 29,942 due to flooding.

K. Other Natural Hazards

148. Timor-Leste has been experiencing a severe drought due to the El Niño/Southern Oscillation (ENSO) phenomenon since the end of 2015; it is a related weather anomaly associated with droughts regionally and occurring in cycles every couple of years. Meanwhile, the latest rainy season which takes place from November 2016 to May 2017, has been insufficient and erratic maintaining drought conditions on most of the island. In addition to El Niño, the La Niña weather phenomena have had a significant impact on Timor-Leste communities, both positive in terms of improving agricultural production and water security; and negative in terms of increased flooding, landslides, and erosion (GoTL 2008).
149. Besides, floods and landslides occur in the event of heavy rains. Generally, landslides occur at higher elevations with a slope about 45° or higher, and on lands along rivers during the times when heavy rains increase the water volume. While on soil structures with cavities and plenty of cracks, the beginning of the rainy season brings a water content which increases rapidly and the soil quickly becomes saturated. Rainwater infiltrates the cracks and accumulates at the bottom of the soil layer and results in lateral soil movement which causes landslides.
150. According to the assessment conducted by the World Bank in several sucos along the Dili to Ainaro road corridor, the communities in these areas consider that weather will become increasingly unpredictable from three years ago. The dry season extends over a longer period of time, and the wet season can occur twice in one year. The beginning of the wet season has been delayed over two to three months. Moreover, strong wind is one of the most destructive hazards in the studied area. Strong wind events normally occur during March-April and September- October. The country experienced about 19 strong wind events (2002 – 2011) affecting 2015 individuals and damaging 1,863 houses.

6.2 Ecological Components

a) Flora and Forest Vegetation

151. In accordance with Timor-Leste's 4th National Report to the UN Convention on Biodiversity (Timor-Leste, 2011b), the main cereal crops in Timor-Leste are rice and maize, and the main cash crop is coffee. Upland agriculture faces additional challenges in the form of 'slash and burns' methods and the loss of soil during heavy rains.
152. Improved breeding materials of key food crops such as maize, sweet potato, cassava, peanuts, and rice have been introduced into the country through the Seeds of Life Programme (SoL Annual Research Report 2007). Furthermore, the number of examined species was expanded to include potatoes, mung beans and climbing beans (cf. SoL Annual Research Report 2009). Rice is commonly grown in the warmer lowland areas while maize is grown at medium altitudes. Other crops such as root crops are grown at even higher elevations.
153. The generic situation of flora and vegetation is well documented, however, there are no comprehensive floral and forest inventories. Refers to the preliminary survey of the flora and fauna of Timor-Leste conducted in collaboration with Birdlife International, more than 251 tree species had been identified as native. Most valuable native species are sandalwood (*Santalum album*; considered critically endangered species) and rosewood (*Pterocarpus indicus*).
154. The dominant natural vegetation of Timor-Leste originally consisted of the closed forest with areas of natural sedge and grassland vegetation on the floodplains of Lake Iralalaru. The primary forests around Los Palos and in the Lake Iralalaru basin have extensively been converted by humans into grassland, cropland and secondary forests (the Democratic Republic of Timor-Leste, 2011b). According to the first detailed forest cover maps released under a JICS, the total cover of a forest is 58.9%, of grassland 27.4%, of very sparse forest 4.2%, of bare land 3.3%, rice paddies 2.8%, water bodies 1.6%, dry farmland 1.5% and settlements 0.2%.
155. In 2011, was estimated that forest cover makes up some 453,850 Ha of Timor-Leste's land area with primary forest vegetation covering a minimal 1 - 6 % of the country's land area. The main types of forest in Timor-Leste according to the Ministry of Agriculture and Fisheries (MAF) are dry lowland forest, moist forest, montane forest, and swamp. The typical trees of the slopes according to MAF include *Sterculia foetida* (a tropical chestnut) *Calophyllum teysmannii* and *Aleurites moluccana* (candlenut) but the three dominant native species are *Eucalyptus alba*, *Eucalyptus urophylla* and *Pterocarpus indicus* (narra). *Narra Calophyllum teysmannii* and *Santalum album* (sandalwood) are valuable species.
156. The study done by Triandor, C.R (2010) found that the distribution and status of vegetation types in Timor-Leste are poorly known, makes it difficult to categorize Timor's tropical forest types. However, several schemes have been published for silvicultural studies (Meijer-Drees 1951), transmigration studies (RePPProT 1989) and conservation assessments (Cowie 2006). Comparison of names used for tropical forest, mangrove and wetland vegetation on Timor (and Nusa Tenggara region) presented in Table 6.3.
157. The ROW passes through agricultural areas, villages, montane forests, plantation areas, and small-town settlements. Within villages of Nunumogue, Manutasi, Bobo Leten, and Katri Kraik, these will be encompassed in whole or in part of the boundary of the Mount Tatamailau/Ramelau Protected Area, based on Government Decree No. 05/2016. Human impacts on the vegetation are most pronounced in the areas, especially near the roads.
158. Farmland and plantation dominate the medium elevations (800 – 1500 m, a.s.l), whereas woodland dominates the high elevations. The roadside woodlands on Section

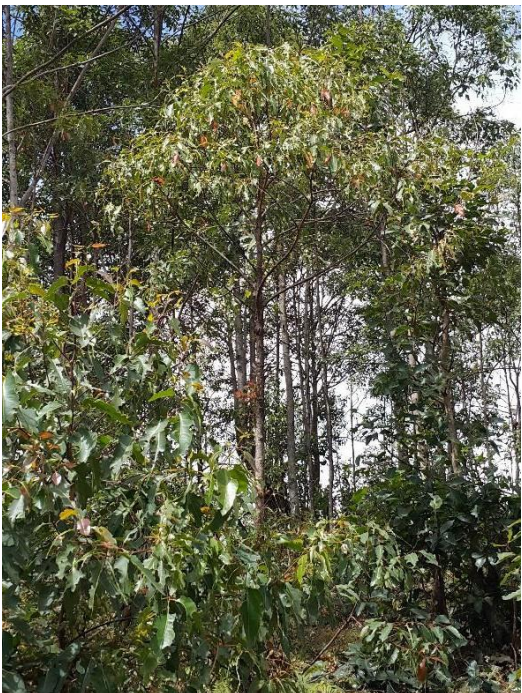
1 and 2 at medium and higher levels are dominated by kind of plants such as *Falcataria molucanna*, *Eucalyptus urophylla*, *Ambrenius* (abrenius), *ai fuanbot* (ai anan tun), shrubs and grasses. Furthermore, from the road hinterland at lower levels are *Musaceae sp.*, *Psidium guajava*, avocado, albizia woodlands, and coffee plantations. The vegetation in the project area varies with topography and soil type except for perennial species that grow in all areas such as shrubs and grasses.

159. When the alternative 3 will be applied to the Branch Road Project, hence some vegetation planted by communities and many trees need to be removed to complete the Project; as all sections will be widened to comply with road national standard. Land use within the Project corridor is partly cultivated by the community with agricultural crops or plantation, meanwhile, forest trees mainly found at woodland and the hilly slopes. In addition, there are small patches of grasslands near to the settlement areas in Aituto, Hatobuilico, and Letefoho.
160. The wooded areas extend on the slopes above and below the road to the hinterland. Among the tree species recognized along the road i.e. *Eucalyptus urophylla*, *Albizia sp.*, *Pinus sp.* (pine tree), *Araucaria heterophylla*, *Prosopis palida*, *Terminalia catappa*, *Gmelina arborea*, and *Lannaea coromandelica* are also present along the Project corridor. The typical vegetation cover along the Project corridor is shown in Figure 6.13. These photographs are from the mountainous section of Hatobuilico and Letefoho.

Table 6.3. Comparison name for Tropical Forest

Meijer-Drees (1951)	Vegetation formation (Monk <i>et al.</i> 1997)	Vegetation communities (Whistler 2001)	Inferred Vegetation formation (Cowie 2006)
	Heath forest		
	Freshwater swamp forest	Swamp forest	Swamp forest
evergreen forests in the lowlands/lower hill/low mountains	Lowland evergreen rainforest: also, Forest over ultrabasic rocks		Lowland evergreen rainforest
mountain forests (dominated by <i>Podocarpus</i>)	Montane forest (seasonal lower montane forest, seasonal upper montane forest)		Montane forest (aseasonal)
	Semi-evergreen rainforest		<i>Pouteria nitida</i> – <i>Pometia</i> – <i>Syzygium</i> forest (putative semi-evergreen rainforest)
	Moist deciduous forest	Lowland alluvial forest	<i>Canarium</i> – <i>Calophyllum</i> forest (putative moist deciduous forest)
	Forest over limestone rocks	Lowland limestone forest	
Monsoon or savanna forests	Dry deciduous forest		Dry deciduous forest
	Thorn forest		Thorn forest (dry vine thicket – putative)
	Coastal forest	Littoral forest; Sandy beach strand; Rocky cliff strand	Coastal and strand vegetation
	Tidal forest		Mangroves
		Marsh	Herbaceous wetland and aquatic communities
		Swamp forest	<i>Nauclea</i> forest/woodland

Figure 6.13: Typical Vegetation along of Project Area

	
<i>Eucalyptus urophylla</i>	<i>Falcataria molucanna</i> (Moluccan albizia)
	
<i>Pinus species</i>	<i>Araucaria heterophylla</i>

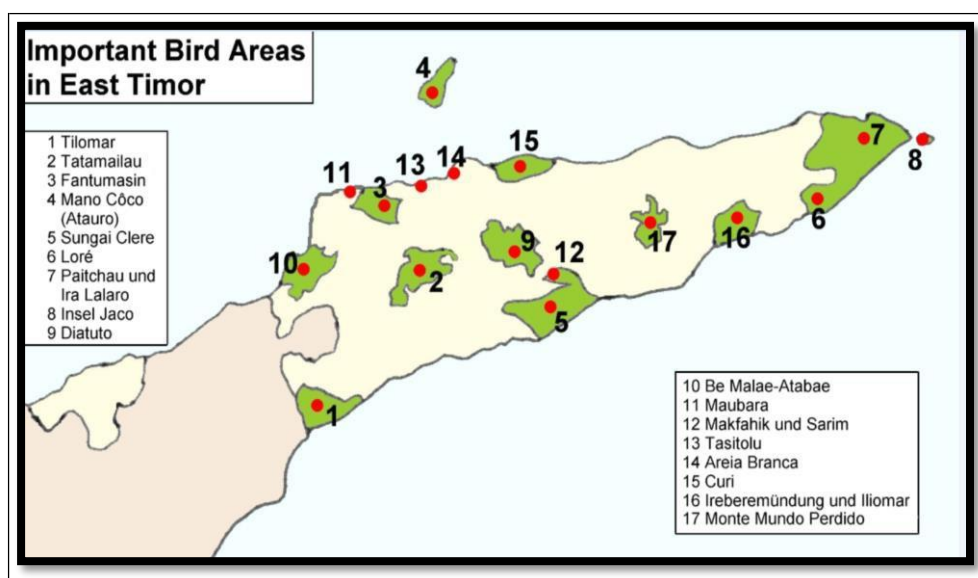
Source: KEI – Field survey 2018

b) Fauna and Wildlife

161. Timor's present-day fauna is the result of natural colonization by overwater dispersal and more recent human-mediated introductions (from the Orient, Australia-Papua, Wallacea and Old World, with some tramp ants from Africa and South America), as reported by Trainor, C.R 2010 that subsequent in-situ speciation and extinctions over the last 4 million year.

162. Humans have had a major direct impact on the biodiversity of Timor by hunting some species to extinction and introducing others, and by indirectly altering landscapes by clearing and burning for agriculture, including the road infrastructure built as access for agricultural purpose. The colonization of Timor by hunter-gatherers, and later by the Austronesian's, together with the relatively recent period of Portuguese and Indonesian colonial rule, and traditional forms of resource management, has also played a role in the distribution and extent of habitats, and consequently on wildlife populations (Trainor, C.R, 2010).
163. Birdlife is still the main reference for wildlife fauna of Timor Leste (Trainor et al, 2007a). The report describes the fauna wildlife of Timor-Leste as characterized by the biodiversity of Southeast Asia with certain elements of the Australian continent. Some common birds of open country and forest on Timor: Black-backed Fruit-dove (Romang Island); Wallacean Cuckooshrike, Helmeted Friarbird, Emerald Dove, Kara Vella (Vermasse), Richard's Pipit, all found in Hatu Builico village (Trainor, C.R, 2010).
164. The wildlife fauna of Timor-Leste (Trainor et al, 2007a) is made up of the following: (i) 224 species of birds, of which seven species and two genera are endemic to the island. Most of the birds and larger mammal species native to Timor-Leste are arboreal and majority of these species are dependent on closed canopy tropical forest; (ii) Minimal 52 mammal species occur in Timor- Leste, mostly small and mobile species; (iii) bats are a well best represented group in Timor- Leste with at least 34 species, including 12 species of fruit-bats; (iv) 15-20 amphibian species and 40 or more reptilians were found in Timor-Leste; and (v) saltwater crocodile is also present in the coastal zones.
165. In the book of Important Bird Areas in Timor Leste, Trainor et al. (2007b) identified the most important bird area is the Nino Konis Santana National Park (#6 – 8 in Fig 6.14) at the eastern end of Timor-Leste, the first area of the country to be protected. Through Integrated Biodiversity Assessment Tool (IBAT) for the World Bank Group, the Project road has been identified passing through the Tatamailau Mountain (#2 in Fig 6.14). Subsequently, the important bird areas proposed in the book are shown in Figure 6.14.
166. The road is the main transport mode in Timor-Leste, while roads are critical for economic growth and social development; ecosystems and the services they provide are vital for sustaining life. However, roads are key drivers of land use change and deforestation threatening biodiversity, as roads can act as physical barriers or may serve as behavioral barriers for wildlife. Road width, verge characteristics, the animals' behavior and its sensitivity to habitat disturbances are also key factors to increase fragment isolation that generally reduces the abundance of birds, mammals, insects, and plants.

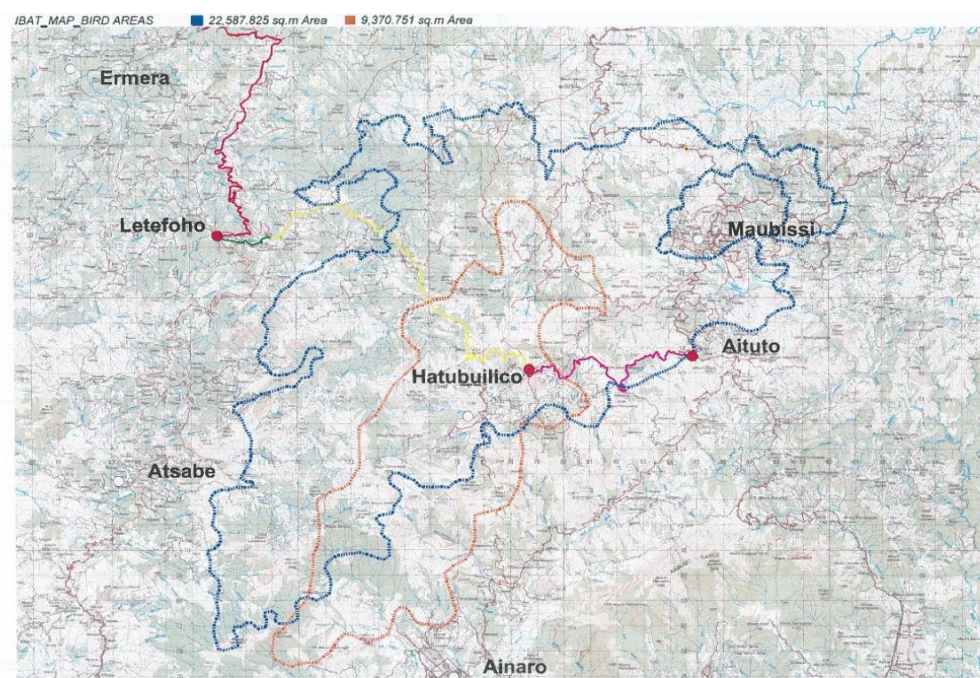
Figure 6.14: Important Bird Areas of Timor-Leste



c) Protected Areas

167. In the short time since independence, Timor Leste has acted quickly to institute processes to form protected areas consistent with the Programme of Works for Protected Areas (PoWPA), under the United Nation's Convention on the Biodiversity Conservation (UNCBD). The Timor- Leste government signed the Convention on 10 October 2006 and became a Party to the Convention on 8 January 2007. As a signatory to the UNCBD, Timor-Leste undertakes to fulfill the Convention's requirements which include the PoWPA. The PoWPA is a global action plan to assist with the establishment of protected areas to cover at least 10% of each country. The focus of the global programme is for governments to identify and then fill gaps in their existing protected area networks (PANs).
168. The UNTAET Regulation No. 19/2000 on protected places lists 15 'Protected Wild Areas'. According to Birdlife International, many of these areas were identified as priority conservation areas by FAO/UNDP and the Indonesian Government back in 1982. However, boundaries had not been defined and the 15 sites have not been recognized in land use planning (Trainor 2007, cited in Trainor 2010). This regulation states that one of the protected wild areas is the summit of Tatamailau (Ramelau) Mountain, all elevations on Tatamailau Mountain above 2000 meters, and the surrounding forest, an area of approximately 20,000 hectares.
169. The national system for the protected area came into force through Decree Law 05/2016 (*Decreto Lei No. 5 of 2016 Sistema Nacional De Areas Protegidas*). The decree identifies 44 terrestrial and 2 marine protected areas and supersedes UN regulation (UNTAET Regulation No. 19/2000). Currently, all protected areas are in various stages of biological assessment and planning. Most of the areas have not yet been systematically surveyed due to the Government's lack of personnel and financial resources, hence formal boundaries have not been established.
170. The issues of land ownership remain unresolved, which means the protected wild areas' are not consistently recognized in land use planning. The Protected Areas and Important Biodiversity and Birds Area where the Project corridor is passing through shown in Figure 6.15.

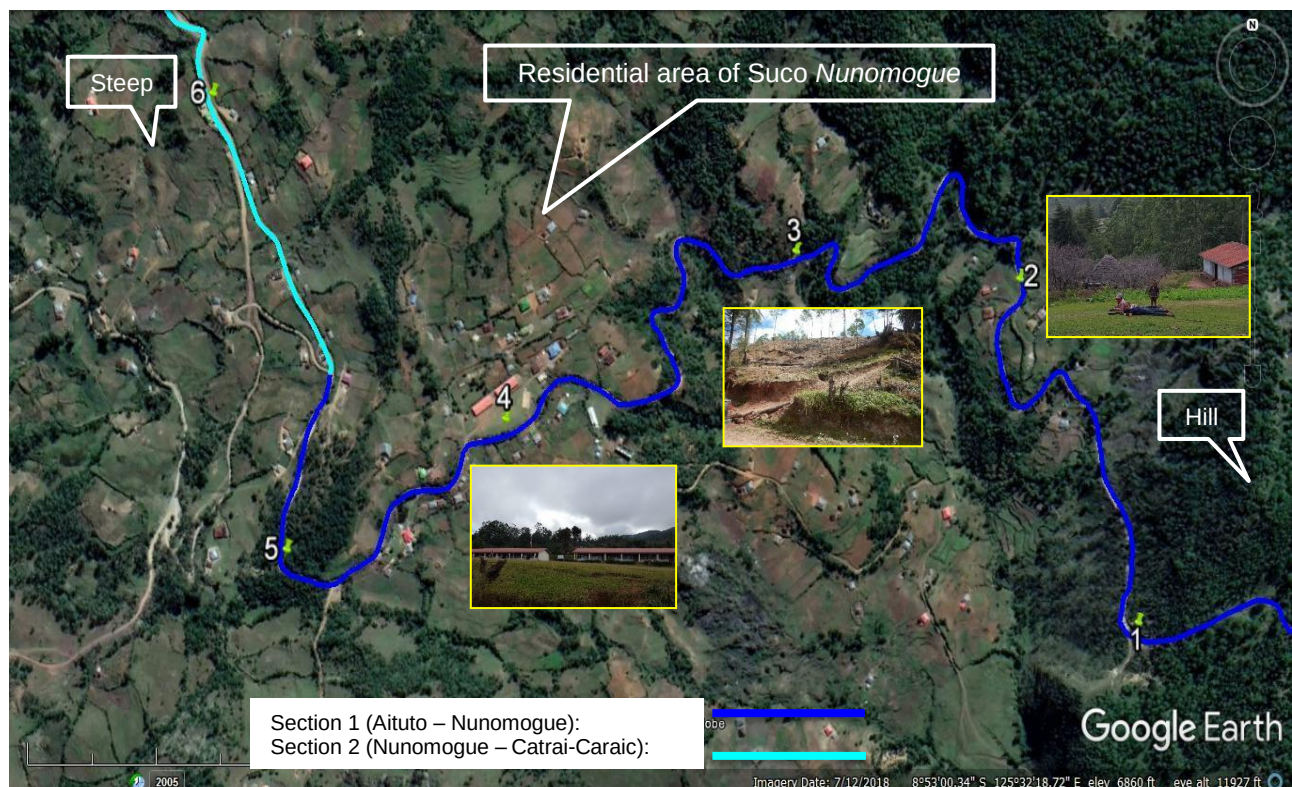
Figure 6.15: Protected Areas and Important Bird Areas



Source: IBAT for World Bank Group, 2018 and DL 05/2016.

171. Referring to UNTAET Regulation 19/2000, activity of hunting is prohibited, though it is noted that it is still a common means of food collection throughout the island. There is a consideration that the protected areas are to be managed in a way to allow activities in accordance with laws and tradition by local communities, such as a) the harvesting of non-timber forest products; b) the selective grazing of animals; c) the use of non-endangered animals and plants for religious and cultural ceremonies; d) the traditional hunting of non-endangered species; and e) the traditional cutting of trees at elevations below 2,000 meters a.s.l, provided it is done in a sustainable manner and without the use of machinery.
172. The Section 1 and Section 2 (Aituto – Hatubuilico – Letefoho) road passes through Mount Ramelau (Tatamailau) Protected Area which starts about 12 km from the south of the Project road. The protected forest areas are already accessible for such activities due to the presence of the road and settlements at the fringe of the forests.
173. Although the boundaries of protected areas have not been marked, the areas adjacent to Project corridor are transition areas, where habitat and traditional subsistence farming and gathering are allowed and the construction of the Project will not have any impact on the ecological function of the protected areas.
174. The construction activities at the section of Project corridor that within the Mt. Ramelau Protected Areas shall be managed accordingly and should not have any direct adverse impacts on the protected area. Guidelines for construction within the protected area section are given in the Environmental and Social Management Plan (ESMP).

Figure 6.16: Protected Forest Area Mapping – Section 1



175. Figure 6.16 is the aerial mapping of protected area within Section 1 and Section 2. It shows that the land cover in that area is not occupied by dense trees and is no longer a primary forest since the area has developed since the road opened.

176. The road section of Aituto – Hatubuilico – Letefoho was not laid such in the protected forest, it was the land owned by the community for their residential area or farmlands. The farmlands and residential could be seen along the way of the existing road, hence there is no threatened plant and animal species were observed (see Figure 6.17).
177. There is no boundary mark of protected forest on the field, hence difficult to indicate where is the demarcation between protected area and community land. Moreover, the area around the existing road section was observed as the open space (Figure 6.18).

Figure 6.17: Community Land - Farm Land & Residential



Figure 6.18: Open Space on the side of Existing Road



178. In the area that specified as protected forest, most of the area has converted to farmland or plantation by the local community. Approximately 100 meters beyond the existing road, there was a school building that utilized by the community from the suco around of existing road to send their children to the primary school (Figure 6.19).

Figure 6.19: School Building surrounding of Existing Road



Figure 6.20: Protected Forest Area Mapping – Section 2



179. Branch Road Section 2 is starting from existing road area of Nunomogue Suco; as the nearest village and access to the Ramelau Mountain, the protected area. The land use status within Section 2 is a developed area. Community from vicinity villages has developed the area, mostly for their farmlands. The land use change is shown in Figure 6.21 below.

Figure 6.21: Open Area – farmland



180. The landscape adjacent to the existing road of Section 2 observed as open forest. The villager usually burns the area for opening their farmland and remaining the dead trees and bushes that made them easier to do cultivation (Figure 6.22).

Figure 6.22: Open Area – bush and dead trees



181. Most of the area within Section 2 has converted to farmland or plantation by the local community. Whereas another open area was used as grazing land for their cattle (horse, cow, and buffalo) and housing (Figure 6.23).
182. Additional information on the aerial mapping for Section 1 and 2, similar to the information provided above, can be found in Appendix 2.

Figure 6.23: Open Area – grazing land and housing



183. Field survey confirmed the baseline data collection and assessment which were conducted by Katahira & Engineering International in December 2018 as summarized below:

- The proposed Branch Road Project majority was comprised of open forest and modified agricultural land that dominated by coffee plantations. Other cultivated species such as vegetable and fruits are present, especially in surrounding of Section 1. The coffee plantations are interspersed with scattered trees (usually fruit trees) which provide varying amounts of canopy cover. The coffee trees are not considered to be a natural habitat and are of low ecological value.
- Partly of proposed Branch Road section traverses the area of protected forest; where significant agricultural encroachment has led to the clearance of the original primary forest for which it was designated. The survey observes that the forest has already been cleared due to the access road development and encroachment by the community and local farmers. The overall direct and indirect impacts of the Project, therefore, be negligible and as the construction and operation in Section 1 and 2 will not lead to the loss of natural habitat within the Project's area of influence. OP4.04 Natural Habitat is triggered as the precautionary for working thoughtfully in the protected areas, even though the boundaries/markings have not been defined. The nature of the project will focus on ground construction works and therefore, potential risks on birds' movement, if any, shall be manageable. The project will apply land clearing procedures taking into account the prevention of adverse impacts on birds' nests and their habitats.
- No threatened habitats, both plants and animals, were recorded in a protected area which traversed by the Branch Road Project, though BirdLife International has identified the endemic bird species of Mount Tatamailau (Ramelau), globally threatened species based on IUCN Red List Category. This is possibly due to highly degraded forests in the Section 1 and 2 road corridors and several spots of open areas due to reportedly past burning/clearing for military operations in 1990s.
- The proposed Project areas are open forest, agricultural land, and coffee plantation, not Primary Forest, and are thus botanically impoverished; no plant species of conservation interest are present. Furthermore, endemic bird is associated with primary forest, of which none occurs in the proposed Branch Road Project area.
- From a biodiversity point of view, though no threatened habitats were recorded; there was habitat fragmentation occurred previously when the access road was opened. If a cleared area is reforested or allowed to regenerate, the increasing

structural diversity of the vegetation will lessen the isolation of the forest fragments.

- There is no cumulative impacts issue is anticipated as a result of environmental and social impacts associated with the upgrading of the existing road.

184. To ensure sound risk management pertaining to natural habitats, particularly endangered birds in secondary forest areas where the construction activities will take place, the PMU is responsible to appoint a bird specialist with thorough knowledge of avifauna in Timor Leste region to observe and examine the presence of bird's nest prior to trees removal with the following steps:
- a. There are several ways to detect bird nests: 1) look on the ground for concentrations of white-colored droppings, then check the vegetation above; 2) look for birds flying out of vegetation close to the observer and intensely watching the observer as the birds may have a nest nearby; 3) sit quietly and watch for birds that may be bringing nest material or food repeatedly to one place. Birds tend to place their nests just on the undersides of the tree canopy and where branches join together. If adult birds are observed flying to and from a nest, or sitting on a nest, it can be assumed that the nest is active.
 - b. A good rule to abide by is to delay construction activity that would occur within 300 feet of an active nest until the nest is no longer active.
 - c. Tree trimming, and pruning must be stopped any time there are active nests observed in the tree.
 - d. Keep watching on the active nest, and when the chicks have left the nest and activity is no longer observed around the nest, it is safe to continue construction in the nest area or trim the tree.
 - e. The bird specialist could provide other mitigation options to be implemented by the project.

d). Protected Species

185. Refer to the Section 3 of UNTAET Regulation No. 19/2000 on Protected Places, it provides the species of animals that constitute endangered species within Timor-Leste are: (i) sea tortoises; (ii) sea turtles; (iii) marine mammals, including bottlenose dolphins, whales and dugongs; (iv) crocodiles; (v) all animal and plant species listed in the Convention on the International Trade in Endangered Species (CITES); and (vi) any other plant or animal species designated as endangered by the Transitional Administrator. Additional protected species were listed in issuance in 2005.
186. Partly of sub-project road i.e. from Aituto – Hatubuilico – Letefoho passes through Mt. Ramelau (Tatamailau) Protected Area, which starts 12 km from the south of the Project road. In the early 1980s, the Tatamalilau mountain was extensively covered with old growth montane forest and was identified by BirdLife International (BI) as an Important Bird Area as it supported several endemic and restricted-range bird species. This conclusion was supported by the UN Administration of Timor Leste in 1989 (Trainor et al. 2007).
187. The government of Timor-Leste formally designated the Mount Ramelau Protected Area in 2016 to protect 20,000 Ha of dry tropical forest and associated wildlife on Mount Ramelau. The designation of an Important Biodiversity and Birds' Areas (IBA) by BI in combination with the designation of a protected area by GoTL.
188. The Key Biodiversity Area (KBA) factsheet launched by BirdLife International showed that some endemic species of Mount Tatamailau (Ramelau) were mostly birds is globally threatened species based on IUCN Red List Category. List of endemic species shown in Table 6.4. However, no threatened habitats, both plants and animals, were recorded in a

protected area which traversed by the Branch Road Project, though BirdLife International has identified the endemic bird species of Mount Tatamailau (Ramelau), globally threatened species based on IUCN Red List Category. This is possibly due to highly degraded forests in the Section 1 and 2 road corridors and several spots of open areas due to reportedly past burning/clearing for military operations in 1990s.

189. The proposed road rehabilitation and improvement project will upgrade an existing roadway by widening, resurfacing, improving drainage system, and stabilizing slope condition, include shifting alignment on few areas to avoid the old trees or cultural history. There will likely no significant negative impacts on forest vegetation or birdlife as there is no longer primary forest in along the road corridor of Section 1 and Section 2.
190. The improved roadway is expected to easier access to Mt. Ramelau and increases tourism activities, though this could lead to increases in the rates of urbanization or conversion of forest to farmland. This negative outcome would be a long-term consequence of road improvement that is beyond the control of the executing and implementing authorities of the road Project. It will be the responsibility of the Department of Protected Areas and National Parks, Directorate of Forestry in Ministry of Agriculture and Fisheries to ensure that forests on Ramelau Mountain are protected, irrespective of the condition of the roadway.

Table 6.4. Endemic Species of Monte Tatamailau (Ramelau)

Taxonomic group	Species	Common name	IUCN Red List Category	Factsheet
Birds	<i>Aprosmictus jonquilleus</i>	Jonquil Parrot	NT	
Birds	<i>Cyornis hyacinthinus</i>	Timor Blue-flycatcher	LC	
Birds	<i>Ducula cineracea</i>	Timor Imperial-pigeon	NT	
Birds	<i>Ficedula timorensis</i>	Black-banded Flycatcher	NT	
Birds	<i>Gerygone inornata</i>	Plain Gerygone	LC	
Birds	<i>Lichmera flavicans</i>	Flame-eared Honeyeater	LC	
Birds	<i>Philemon inornatus</i>	Timor Friarbird	LC	
Birds	<i>Phylloscopus presbytes</i>	Timor Leaf-warbler	LC	
Birds	<i>Trichoglossus euteles</i>	Olive-headed Lorikeet	LC	
Birds	<i>Turacoena modesta</i>	Black Cuckoo-dove	NT	
Mammals	<i>Rusa timorensis</i>	Javan Rusa	VU	

6.3 Economic Components

a) Agriculture

191. The beneficiaries in the Project area mostly are rural subsistence farmers who obtain a small amount of income by selling cash crops such as coffee, vegetables, and fruits. Local resident trades their produce for cash to the local community and the travelers through shelters or small marketplaces built by the government. These markets are neither getting impacted by the planned construction activity for the project road nor they pose any impact on the planned repair, restoration and asphalt overlay of the Project road.
192. Agriculture-type in the Project area within Ainaro Municipality mostly is horticulture such as vegetables, carrot, potato, and onion. Meanwhile, the agriculture of Ermera Municipality dominated by coffee. Most of the municipalities' population works in agriculture that predominantly growing and harvesting coffee. Ermera produces approximately 1-3 hectares, and each hectare will produce 250 kg of dry coffee. Therefore, a family could generate an annual income of USD 200 – 250 from a small to medium size allotment. This is supplemented by the cultivation of food crops, in

- particular, cassava and rice in the lowlands, and sweet potatoes in the mountains. In addition, vegetables, corns, and bananas are also produced for local consumption.
193. The economy of Ermera municipality is strongly exported-oriented when it becomes a coffee- growing region. However, it has an adverse impact on food provision in the municipality itself. While the municipality has about 12% of the country's population, it does not produce an equivalent amount in terms of the main staple crops (corn, rice, and cassava). The population normally relies on income from the sale of coffee for purchasing additional quantities of rice, corn, and beans.
 194. The activity of coffee harvesting usually is between June and August, where the families receive coffee payment at this time. However, food sufficiency sometimes is a problem in the region, due to the income produced by coffee is normally spent within a few months. Moreover, food crops are normally harvested in subsequence (rice in August – September, sweet potatoes in October). For this reason, access to food is difficult for many families between November and March or until the corn harvest. Even during normal times, most of the population lives just only above the subsistence level.
 195. The proposed Project has a chance to involve women in cultivating spices and other herbs in household gardens. This will enhance the role of women in the community, moreover, the world market is favorable for the production of species from a non-polluted climate. The climates of Ermera and Letefoho administrative posts are particularly suitable for herbs. The other species with a well- developed root system, for example, bay leaves, can also help bind the soil in an area as prone to a landslide as Ermera.

b) Livestock's

196. Livestock plays an important role in the economy of Ermera Municipality. Between 1989 and 1997 a strong increase was registered in the number of livestock present in the municipality. In particular, the number of cows increased from 1.500 to 6.700, buffaloes from 1.100 to 36.000 and horses from 400 to 2.700, while pigs registered a decrease from 17.200 to 9.100.
197. Ainaro Municipality Census in 2016 reports that a number of private households that involved in livestock rearing in Horaic Quic Suco are 274 households, and Nunomogue Suco is 621 households, meanwhile, Mulo Suco is the most among two previous sucos i.e. 1,061 households. In Ermera Municipality, Goulolo Suco is the lowest among five sucos in Letefoho administrative post with 111 households that involved in livestock rearing. Furthermore, the highest is Haupu Suco which has 700 households, meanwhile, 3 sucos i.e. Catrai Caraic, Ducurai, and Eraulo are almost similar with the number of households is 448, 422, and 301 respectively.

c) Forest Resources

198. Natural and semi-natural land use pattern in Timor-Leste consists of primary and secondary forests, streams and lakes and coastal areas. Broadly the land can be divided into six ecological zones i.e. mountainous areas, the highland plains, moist lowland areas (along with the southern coast), arid lowland areas (along with the northern coasts), marine and coastal areas, and urban areas. With the population increase and forests exploitation during the colonial period, the area of forests has been reduced in its extent and condition, partly through clearing for agricultural purposes and partly through uncontrolled timber harvesting. An estimate for the period between 1972 and 1999, which roughly coincides with Indonesian occupation, indicates that 114,000 hectares of dense forest and 78,000 hectares of sparse forest were lost (CEFAGE, 2011).
199. In the past, Timor-Leste was well endowed with natural forests and in the middle age was known by Portuguese navigators that arrived at its coasts as the land of sandalwood. When the Portuguese arrived in Timor-Leste prosperous commerce of sandalwood was already in place with South East Asia countries. Previously, the natural forest has two indigenous tree species produce valuable timber such as suren (*Toona sureni*) and

sandalwood (*Santalum album*). In addition, extensive areas of Ai ru (*Eucalyptus urophylla*) occur in moderately dense forest, and Ai bubur (*Eucalyptus alba*), is found in open forest and savannah woodlands. The tropical dry monsoon forests include a mixture of species, of which the most important is Ai na (*Pterocarpus indicus*). Teak (*Tectona grandis*) is also a significant timber tree, first established in Timor more than 100 years ago. Suren is an attractive furniture timber, whilst sandalwood is one of the most valuable and easily marketable of all timbers.

200. Ministry of Agriculture, Forestry and Fisheries documented that Timor-Leste has a total forest area of 1.4 m Ha, with estimated 350,000 Ha of forest under threat from degradation. The environmental current issues that related to forest resources is widespread use of slash and burn agriculture has led to deforestation and soil erosion. Agroforestry is regarded as a good alternative to traditional slash and burn cultivation in the uplands, as farmers are able to produce forest trees and fruit trees as well as cash crops and livestock. Around the coast, mangrove areas are common and these have been exploited for fuelwood and other products.
201. The forest area of the Project corridor, especially in the Mount Tatamailau (Ramelau) Protected Area was considered a modified habitat with very little natural tree cover remaining. There is no more primary forest, as stated in the CBD Fifth National Report that there are only 1.7% of the total land area of Timor-Leste is still covered by primary forest. Significant areas of primary forest can be seen in Lautem and Covalima municipalities. The last major stretches of old primary forest are mainly located in the Tutuala administrative post of Lautem. Unfortunately, community is still not aware of their forest condition; recent evidence in Nunumoge when some trees cut to open access from suco area to other direction.

d) Tourism

202. Timor-Leste has a tourism development called CBET (community-based ecotourism). This is a form of ecotourism where the local community has substantial control over, and involvement in, its development and management, and a major proportion of the benefits remain within the community (WWF International, 2001). According to the Ministry of Tourism, Arts and Culture of Timor-Leste, CBET is a type of alternative tourism which can economically, socio- culturally, and environmentally benefit its local people. Principally, any type of tourism enterprise associated with tourism should be driven by local people.
203. Ainaro Municipality is one of the most popular tourist sites in Timor-Leste with Mt. Ramelau as the country's highest mountain which located in this area; hence both administrative posts of Maubisse and Hatubuilico also receive a lot of visitors. Ainaro well-known with spectacular scenery that provides wonderful opportunities for exploring and hiking from the central mountains to the summit, includes pilgrim tourism to Mt. Ramelau, which is sacred to the Timorese.
204. Several CBET enterprises being developed in Maubisse and Hatubuilico, in particular lodges, restaurants, and handicrafts. Besides, a lot of coffee is grown in the Ainaro area and vegetables are cultivated between rocky screes. In this area, ponies are still commonly used for carrying produce and other goods between the isolated villages and markets.
205. The Ermera Municipality's profile recommends that Ermera is one of the most beautiful municipalities which has unique tourist destinations in the region. It has a cool climate, mountain, river scenery, waterfalls, benign and colorful wildlife. Some tourism attraction in Ermera are: swimming and fishing in clear sparkling pools and high waterfalls; hiking, backpacker and camping in pristine forests, and jungle-like coffee plantations; the hot springs of Fatubesi and Koaliati; traditional Timorese culture, including sacred house, food, "Tais" (traditional colorful textile garments for men and for woman), wood and stone carving; see traditional and Luso-colonial architecture; includes national shrine and monument at Mertutu.

206. The improvement of the road in the branch road corridor will improve access and tourism activities in both Ainaro and Ermera municipalities, especially there are some Community Based Eco- tourism has developed in the central zone which includes Ainaro and Ermera.

e) Power and Water Supply

207. Timor-Leste has met the Millennium Development Goals (MDGs) for urban water supply and sanitation with total coverage of access to an improved water source in urban areas was 91%. Unlike in urban areas, Timor-Leste did not meet the MDGs in the rural water supply and sanitation sector, due to in 2015 total coverage of access to improved water sources in rural areas was only 60% from 75% target and improved sanitation services only 30% of target 55%.
208. In Ainaro, the Nugupo Water Purification Plant supplies treated water only for a limited time of a day, and the river water without treatment is directly supplied as tap water while the plant does not supply the water (Shimoyama, Hisamitsu 2011). Whereas in Ermera administrative post, the water supply from Ermera town is seasonal and irregular; with the critical time being August-October. Water supply in Gleno town has extended to the main location in the town and maintenance has been carried out, however, an extra tank is still needed.
209. The main water source in the Project area is spring water and it is plentiful all year round. Water should be piped and stored in water tanks before utilized by the community. Most of the water facilities provided through the company; for instance, Northbridge Rotary Club that provides clean water and sanitation to the remote people in Letefoho municipality. The construction of three kilometers of water pipeline in this mountainous area took three months to complete. It will supply clean water to Letefoho Suco and to its primary school, middle school, and medical clinic.
210. The physical condition of Timor-Leste is arid with long dry season impact to the regular water shortages during the dry season. The main challenge to overcome water shortage is by the development of interseasonal or multiyear water storage facilities at different levels, the development of the huge groundwater potential for agriculture in the river valleys and for domestic water supply, and the development of infrastructure for water supply and irrigation utilities to enhance water productivity and reduce water losses (WB, 2017).
211. The power system in Timor-Leste is small and fragmented and is mainly based on small and medium diesel power plants, as diesel is the primary fuel source for power generation. The electrification is overwhelmingly concentrated in urban areas, with the electrification rate being 88% in urban areas and 19% in rural areas. Many people in Timor-Leste are without electric power; "Approximately 60% of the population of Timor Leste has no access to electricity (East Timor Planning Commission 2002).
212. There has been no reliable method of raising revenue for funding the purchase of hardware, maintenance of electric power supply systems or even fuel and other running costs for generators. Over a twenty-year period, a diesel generator is much more expensive than a solar electric power supply system in Timor-Leste, where fuel is difficult to obtain in remote villages and transport costs are very high.

f) Poverty Levels

213. The lack of infrastructure has further exacerbated the Timor-Leste's food insecurity, and the dislocation of the population during the independence struggle made this country's poverty problem worse. While nominal expenditures grew significantly over 2007-2014, so did the cost of living for the poor. The national poverty line, which represents the average cost of meeting basic needs, grew by 84.5%, from \$25.14 per person per month in 2007 to \$46.37 per person per month in 2014. Within the country in 2014, the poverty line was the highest in Dili, the most urbanized municipality, reflecting its higher cost of

living.

214. The poverty incidence in Ainaro is 79.7% and is the second highest in the country. The municipality accounts for 6% of the total population but 9.6% of the total poor. Meanwhile, poverty occurrence in Ermera is 54.6%. The municipality accounts for 10.4% of the total population and 11.4% of the total poor (World Bank, 2007). However, according to the latest Timor-Leste Survey of Living Standards, the Timor-Leste's National Poverty Rate has fallen from 50.4 percent in 2007 to 41.8 percent in 2014.
215. Timor-Leste faces challenges from its surrounding geography, such as uneven terrain makes both farming and water-gathering difficult, with only 30% of arable land currently used in farming. Around 70% of the nation's population lives in rural areas and are reliant on agriculture as their primary food source. However, they are faced with the challenges of tackling the wet and dry seasons. Natural disasters also make this difficult, with floods and droughts the cause of large losses. Many families who are reliant on farming are only able to produce enough food for eight months of the year (Borgen Project, 2017).

6.4 Social Components

A. Population

216. In 2018, the estimated population of Timor-Leste is 1.32 million, which ranks 158th in the world. The population is mostly concentrated around Dili, the largest city and capital, with a population of 234,000 inhabitants. The population of 1.32 million is substantially higher than in the year 2000 that of just 853,000 inhabitants. Dili municipality has the highest population density followed by Ermera and Baucau municipalities.
217. Based on census 2015, the population of Ainaro Municipality is 63,136 inhabitants which is less than 25% of Dili which has the fastest growing population. While Ermera as the 2nd highest municipality has a population of 125,702 inhabitants. Household size has also risen significantly. These large differences imply gaps in livelihood levels and socioeconomic development between the municipalities. The selected demographic data (population, density, male/female ratio) of communities within the Aituto – Hatubuilico – Letefoho – Gleno corridor is enumerated tables 6.5. and 6.6.

Table 6.5. Population Data of the Project Corridor (2015)

ADMINISTRATIVE UNIT	AREA (Sq. Km)	POPULATION (2015)	POPULATION DENSITY Km ²
<i>Ainaro Municipality</i>	234,65	16.121	68,7
<i>Hatubuilico Administrative Post</i>	129,34	12.966	100,2
<i>Maubisse Administrative Post</i>	191,60	23.750	124,0
<i>Suco Horai-Quik</i>	10,40	1.704	163,9
<i>Suco Mulo</i>	46,65	6.333	135,8
<i>Suco Nunumoge</i>	31,93	4.175	130,8

ADMINISTRATIVE UNIT	AREA (Sq. Km)	POPULATION (2015)	POPULATION DENSITY Km ²
<i>Ermera Municipality</i>	756,47	125.702	166,17
<i>Ermera Administrative Post</i>	91,47	36.105	394,7
<i>Letefoho Administrative Post</i>	133,30	22.128	166,0
<i>Suco Estado</i>	9,75	3.022	310,1
<i>Suco Humboe</i>	6,12	2.305	376,6
<i>Suco Riheu</i>	5,29	2.039	385,4
<i>Suco Ducurai</i>	10,48	4.622	440,9
<i>Suco Eraulo</i>	30,55	2.098	68,7
<i>Suco Goulolo</i>	15,87	1.414	89,1
<i>Suco Haupu</i>	8,44	5.034	596,5
<i>Suco Catri Craik</i>	17,38	2.659	153,0

Source: Timor-Leste Population and Housing Census 2015

Table 6.6. Male & Female Population of Sucos within Project Corridor (2015)

AINARO DISTRICT	POPULATION		
	Total	Male	Female
<i>Ainaro Municipality</i>	63.136 (100%)	32.181 (51,0%)	30.955 (49,0%)
<i>Hatubuilico Administrative Post</i>	12.966 (100%)	6.543 (51,5%)	6.423 (48,5 %)
<i>Maubisse Administrative Post</i>	23.750 (100%)	12.149 (51,1%)	11.601 (48,9%)
<i>Suco Horaiquik</i>	1.704 (100%)	831 (48,8%)	873 (51,2%)
<i>Suco Mulo</i>	6.333 (100%)	3.199 (50,5%)	3.134 (49,5%)
<i>Suco Nunumoge</i>	4.175 (100%)	2.093 (50,1%)	2.082 (49,9%)

ERMERA DISTRICT	POPULATION		
	Total	Male	Female
<i>Ermera Municipality</i>	125.702 (100%)	63.557 (50,6%)	62.145 (49,4%)
<i>Ermera Administrative Post</i>	36.105 (100%)	18.166 (50,3%)	17.939 (49,3%)

Letefoho Administrative Post	22.128 (100%)	11.216 (50,7%)	10.912 (49,3 %)
Suco Estado	3.022 (100%)	1.512 (50,0%)	1.510 (50,0%)
Suco Humboe	2.305 (100%)	1.181 (51,2%)	1.124 (48,8%)
Suco Riheu	2.039 (100%)	1.082 (53,0%)	957 (47,0%)
Suco Ducurai	4.622 (100%)	2.373 (51,3%)	2.249 (48,7%)
Suco Eraulo	2.098 (100%)	1.066 (50,8%)	1.032 (49,2%)
Suco Goulolo	1.414 (100%)	705 (49,9%)	709 (50,1%)
Suco Haupu	5.034 (100%)	2.602 (51,7%)	2.432 (48,3%)
Suco Catri Craik	2.659 (100%)	1.312 (49,3%)	1.347 (50,7%)

Source: Timor-Leste Population and Housing Census 2015

B. Education

218. Timor-Leste had a 3-6-3-3 formal education structure. In the 3-6-3-3 system, there were three years of pre-primary school, which had an official entry age of three and is referred to as ensino pre-escolar. Primary school, which is known as ensino basico filial (1 e 2 ciclo), still has an official entry age of six and a duration of six grades. Secondary school is still divided into two cycles: lower secondary and upper secondary. Lower secondary, which is known as ensino basico filial (3 ciclo), still consists of grades 7-9 and culminates in the Diploma Ensino Basico; upper secondary, which is known as Secundario Geral, still consists of grades 10-12 and culminates in the Diploma Ensino Secundario. In addition, Timor-Leste has an upper secondary vocational education track that lasts three years (ISCED 2011).
219. According to UIS data, the structure of the education system in Timor-Leste changed from 3-6-3-3 in 2016 to 2-6-3-3 in 2017; use caution when comparing data over time where the structure of education cycles has changed. In principle, no years of preprimary school and nine years of primary and secondary school are free and compulsory (UIS.Stat, May 2018).
220. Data provided for Ainaro and Ermera Municipalities is available only in 2010, which shown in Table 6.7. that gives an overview of the status of educational facilities in the Aituto – Hatubuilico – Letefoho – Gleno corridor. The data shows that attendance to primary school is relatively high, while attendance drops on the higher educational level (pre-secondary school). Attendance of the local population to higher education is lower than the national rate.

Table 6.7. Education Level of People Aged ≥ 5 Years Old (2010)

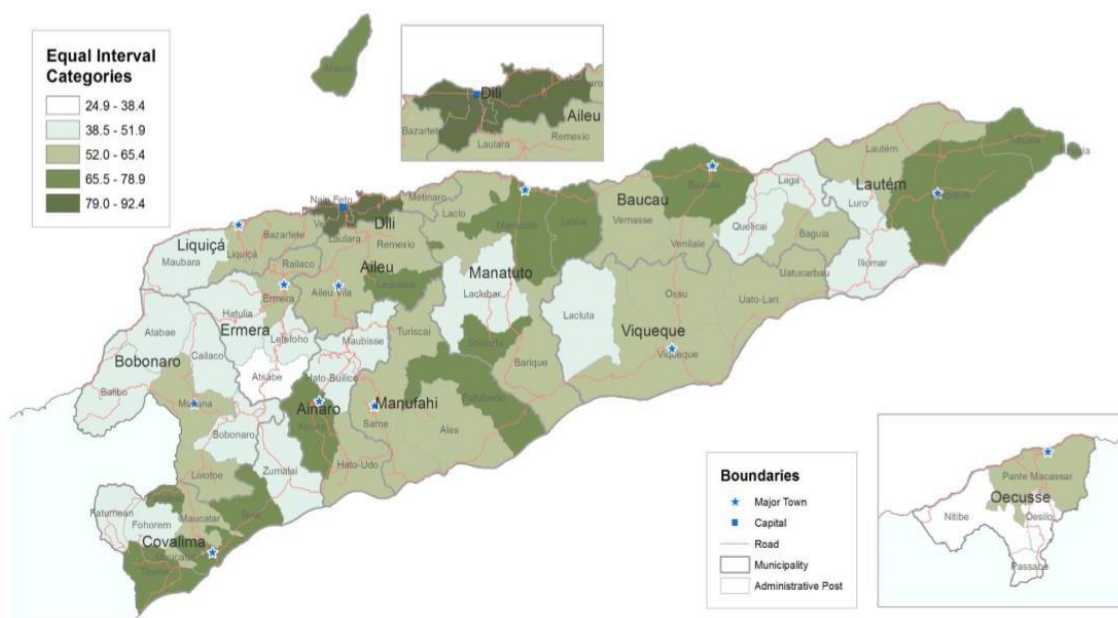
Source:	TOTAL NUMBER OF STUDENT BY LEVEL OF STUDY, SEX AND LOCATION - TIMOR LESTE 2010											
	Pre-Primary Students				Primary School Students				Pre-Secondary School Student			
	Male	Female	Total		Male	Female	Total		Male	Female	Total	
	Total Number	Total Number	Total Number	Persent of Total Area Populat. Aged 5+	Total Number	Total Number	Total Number	Persent of Total Area Populat. Aged 5+	Total Number	Total Number	Total Number	Persent of Total Area Populat. Aged 5+
Timor Leste	7.902	7.718	1.560	1.70%	102.549	93.303	195.852	21.70%	30.487	28.865	59.352	6.60%
Urban	2.931	2.925	5.856	2.20%	26.429	23.712	50.141	18.70%	11.876	11.486	23.326	8.70%
Rural	4.971	4.793	9.764	1.50%	76.120	69.591	145.711	23.00%	18.611	17.379	35.990	57.0%

Ainaro	501	451	952	2.00%	6.244	5.598	11.842	24.40%	1.592	1.515	3.107	6.40%
Ermera	597	588	1.185	1.20%	10.757	9.725	20.482	20.70%	2.725	2.435	5.160	2.20%

Education Monography 2010

221. In 2015, there is great strides have been made in reducing illiteracy in Timor-Leste i.e. when 53.4 % of persons (5 years and older age) could read and write in Tetun increased to 62.5%. The literacy rate for all persons 10 years of age and over is 67.3%, however, women have a lower literacy rate (63.9%) than men (70.6%).
222. The youth literacy rate (15 – 24 years) stands at 84.4%, however, there is still a clear difference between urban and rural areas: 94.3 % of youth in urban areas can read and write compared to 78.5 %in rural areas. Figure 6.16 shown that literacy rate of the population in the road Project area i.e. administrative posts of Maubisse, Hatubuilico, and Letefoho is lower than the literacy of the Ermera administrative post and national rate.

Figure 6.24: Adult Literacy Rate (People Aged 15 – 24 Years Old)



Source: Education Monography 2017

C. Gender Equality

223. The United Nation, the Government, International Organizations, and NGOs have been highlighting women's issues and have been active in designing laws, policies, programs and services to support gender equality and empowerment of women. The *Rede Feto* (NGO network of Women's Groups) has coordinated and supported women's organizations encourage for greater gender equality, including advocating for legislation that supported quotas for women's seats in parliament and in local – level elections and decision making bodies. Nevertheless, women remain marginalized and disproportionately affected by violence.
224. Project positive impacts on gender have highlighted during public consultation, includes:
a) increase in transport services, providing more convenient and faster travel that enabling women/girls to travel safely further from home; b) improvement of rural health, education and other services such as agricultural extension; c) girls have more chance to

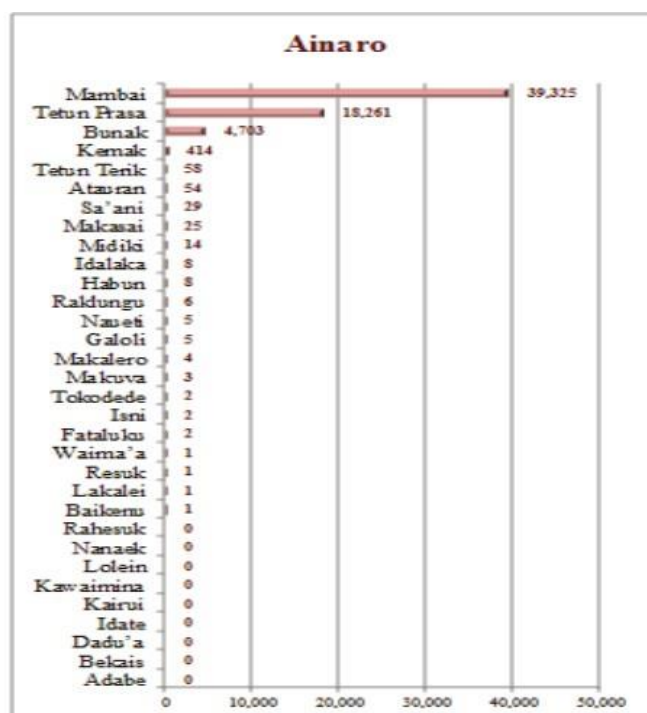
- attend high schools and colleges; d) markets are easier to reach and trading opportunities for women increase; e) more customers during civil works come to the locality and improvement of opportunities to expand small enterprise operated by women; f) employment opportunities generated for local labor including women, especially rural roads with labor intensive construction; g) female headed households are benefited through provisions for local contracting labor recruitment, and local maintenance contracts; h) health and safety problems for women are minimized.
225. Negative gender impacts to be avoided are: increase the spread of HIV/AIDS and trafficking of girls and women; negative influence on the culture, property rights and way of life has already disadvantaged ethnic minorities; increased volume of commercial and private traffic may disproportionately affect the health, security and safety of women and children; resettlement has disproportionately negative effects on women and there are least likely to benefit from compensation; establishment of constructions – and influx of outside or migrant workers can lead to cultural influences, new diseases and negative social impact.
226. Community expects gender sensitive facilities shall be considered in all stage of the Branch Road Project cycle in order to meets the needs of vulnerable genders. These are some recommendations:
- Construction of sidewalk and street lights on community built up or urban areas to avoid accident on the children and elderly citizens;
 - Construction of ramps within urban areas at intersections in front of building structures for easy and safe access of women, children and disabled;
 - Construction of a number of facilities such as toilets and sheds at strategic places along the road.

6.5 Ethnic and Cultural Components

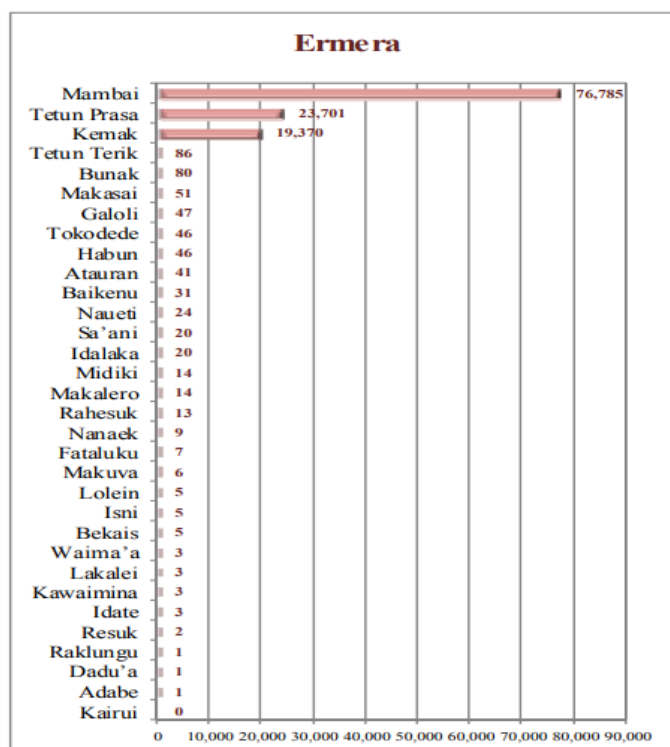
a) Language

227. Ethnic association in Timor-Leste mostly associated with language. There are about 17 languages spoken across the country which are of quite independent linguistic origin. Broadly the languages of Timor are derived from one or two broad language groups; Austronesian (Malay- Polynesian) and Papuan (Melanesian). The constitution and national vision statement have ensured that any differences existing between Timorese people due to language, religion, ethnicity would be respected; values would be preserved within the framework for establishing equal and universal rights for all Timorese.
228. The main ethnic group is the Mambae, predominant in Railako, Ermera, Letefoho, and Hatolia. The Kemak are predominant in Atsabe administrative post and represent a strong minority (around 30%) in Hatolia. Most of the population is bilingual, speaking their own language (either Mambae or Kemak) plus Tetum. Portuguese is still spoken by the intellectual leadership and by a few older people, and the majority of the population understands Bahasa Indonesia.

Table 6.8. Timorese Languages in Project Area



Fonte: Direcção Geral de Estatística
- Censo População no Uma Kain 2015



Fonte: Direcção Geral de Estatística
- Censo População no Uma Kain 2015

Source: District Population based on Language 2015

229. The Mambae-speaking group of Timor-Leste is found in the Ermera, Ainaro, Same, Aileu, and Likisa Municipalities. In Ainaro and Ermera, Mambae community members are swidden cultivators with a social organization that can be characterized as a "house society". The house (uma) is the basic social unit and the focus of Ainaro and Ermera Mambae social organization and relationships.

b) Land Tenure

230. Timorese law establishes two different categories of state land; in article 3 and 4 of Law 1/2003, distinguish between public and private domain of the state. Some of the lands are classified as public domain, with the objective of creating a special and more protective regime of the areas that should be always under the control of the state and be ruled by a special legal regime. All the state land that is not part of the public domain of state is considered private domain and is under the same legal regime as any land belonging to private persons (e.g., an urban office building that is owned by the state. Meanwhile, refers to Law 1/2003 (Article 1.3 to 1.7) were classify urban and rural immovable property based on the location of the property, through the necessity for the delimitation of urban and rural areas have not been approved.
231. There exist "four categories of potential claimants for land in East Timor": traditional occupiers of land, land under Portuguese title, land under Indonesian title, and current possession of the land. The first category of claimants includes traditional occupiers who have held "customary rights to land. Most land in rural areas of East Timor is "not registered in any formal system of land administration and remains [utilized] in accordance with traditional processes and institutions. Generally, land held by traditional occupiers is held in "community- based" groups in customary tenure systems.
232. The community based/origin groups define themselves as first possessors of certain areas of land and have authority over land in most parts of Timor-Leste. Within the system of origin group authority, there are highly individuated rights to land. Residential, garden and plantation plots are 'owned' by families rather than the group itself and remain under family control. The first land law of Timor-Leste was promulgated in March 2003 via Law No.1/2003, which has been designed to serve as an umbrella law or the rest of the land and property regime.
233. Customary land tenure systems (house yard, village reserved land, dryland widen, paddy field, fruit trees grove, sacred site) have operated in Timor-Leste before and during the Portuguese colonial era. Local systems regulated the distribution, transfer, and exploitation of land, and continue to do so. Despite the Portuguese rule and the Indonesian occupation, these local systems have persisted, especially in rural areas of the country. In the Project area, paddy fields practices are absent, but coffee and vegetables are the main cultivation and sources of livelihoods.

c) Historical and Cultural Sites

234. There is no list of existing historical and archaeological sites in Timor-Leste which are disclosed officially. However, the Timorese animist belief systems still found in some parts of Timor-Leste has provided testimony to its long and significant ancient history. Evidence that new people arrived on the island some 3.500 years ago can be seen in the original influences of the distinct languages and dialects of the municipalities, old paintings in caves and rock shelters.

Figure 6.25: Historical Cultural Sites and Landmarks in Road Project Area

	
<i>Heluli</i> cultural heritage; located in Horai Quik suco, Lauheli aldeia (Sta 1+080), about 15 meters on the left of the existing road.	<i>Urbo</i> cultural heritage; located in Katrai Karaik suco, Letefoho administrative post (Sta 16+460), near to the existing road/± 20 meters on the right.
	
Customary House (<i>uma Lulik</i>); located in Kailiti Aldeia, Goulolo Suco, Ermera administrative post. The house uphill, adjacent to the existing road (Sta 35+800) the communities worry it will be impacted by the project, as the hill prone to landslide.	<i>Asunaupae</i> cultural heritage; is a system that consists of holy springs, customary forest, and a mountain, located in Haupu Suco, Letefoho administrative post, that area on the left and right side of the existing road (Sta 41+300).
	
The historical site “red water springs” in the Tetum language is called <i>Bee-mean</i> which from this water the Ermera name. It located in Haupu suco, between the border of Estado Suco and Goulolo Suco. <i>Bee-mean</i> located on the left (±100 meters) of project road.	Letefoho “Parish Church” is the landmarks of Letefoho administrative post. This located in Haupu Suco, adjacent to project road (± 15 m) on the left of the existing road.

d) Community Facilities

235. During field investigation, observed there several existing community facilities located

adjacent to the proposed Project area such as electrical poles and water supply systems (e.g. water supply pipes and water tanks, as well as few shallow wells in the community land). Partly of electrical poles are likely just installed and have no electrical line network, whilst other poles in other area seem has electrical lines to facilitate rural needs. Meanwhile, most of water supply facilities have utilized by the community as their live need.

e) Culture and Tradition

236. The traditional culture of Timor-Leste is centered on a traditional belief system, the Lulik. Timor-Leste's people consist of a number of ethnic groups with different languages and dialects, but they all share a common traditional belief of the Lulik. Lulik comes from the Tetum word that is literally translated as forbidden, holy or sacred. The Lulik's belief encompasses the existence of a divine creator, the spirits of the ancestors, the spiritual root of life as well as sacred rules and regulations that govern the relationships between people and people and nature; social interactions and moral standards with respect to people to people and the people's relationship with nature.
237. The Lulik demands that nature (land, water, trees/forest, rocks/stone) must be respected. This is the reason for ceremonies like the ritual after the harvest of corn and before planting. The ritual is meant to show gratitude and to value the fertility of the land such as the Sau Batar ceremony performed before the corn harvest; one of the important rituals of the Timorese people. A prior social assessment conducted for the BRP indicates that community practices on Luliks were neither identified nor reported along the proposed road corridor (Jeffrey A, 2018). However, the project through engineering measures and consultations intends to enforce precautionary measures to avoid impacts on cultural and spiritual sites, and respect communities' ritual practices pre- and during construction stages.
238. Social identity and exchange patterns are defined through the relationships of Umane (wife giving houses) and Feto-saa(n) (wife taking houses). These two types of kinship structures are seen to play mutually enforcing roles, pledged to provide security and fertility to each other. Generalized exchange characterizes marriage alliances that are contracted between and among houses. Houses are also arranged hierarchically around chiefdoms, thus having a significant role in the local political organization. Individual houses are also the focus of life-cycle rituals and private rites with the presence of both wife-takers and wife-givers, while collective rituals involve the entire community.
239. Traditional/customary hierarchical local structures are still observed to a varying degree in the proposed Project area such as Estado, Eraulo, and Goulolo. Executive figure as kings (rei) or rulers (regulo) acknowledged by the peoples of those Sucos. *Nai Liurai* (head of the chief) and *Nai Dato* (chief) are commanded under the King (regulo). Another hierarchical local structure identified in the area is *Rai nain* (landlord) or representative of the ancestral. *Rai nain* has significant power over land and decision making at the local level. The *Nai Liurai* and *Nai Dato*, however, had a certain degree of autonomy and authority to deal with the affairs of their chiefdoms, particularly when settling internal disputes and matters of inheritance and land issues. They also had authority to organize the inhabitants of their chiefdom for common undertakings, whether this involved communal work or ritual undertakings.

f) Tara Bandu

240. Another customary practice of peoples which is still observed in the proposed Project area is Tara Bandu. Tara Bandu is a Timorese customary system which is meant for establishing social contracts based on spiritual beliefs. While such practice differs to a varying degree amongst individuals and communities, there are generally three categories of Tara bandu, (1) regulating people to people relationship; (2) regulating people to the animal relationship; and (3) regulating people's relationship to the environment. Local and international organizations are supporting this traditional system in communities as a

-
- means for strengthening natural resource management systems and addressing identified conflict drivers in communities.
241. Several examples of Tara Bandu in existence which regulate the people relate to the environment and these Tara Bandu are meant to regulate access and use of natural resources. This is a traditional system for protection and management that ensures sustainable resource use. In the Tara Bandu process, communities set out the procedures and methods allowed when utilizing/harvesting natural resources and the penalties for those who violate them.
 242. Tara Bandu varies widely in form and content throughout the country and is known under different names (e.g. Lobu and Kerok) in different parts of Timor-Leste. This customary practice is used mainly by traditional leaders to build trust within a community, helping to shape consensus on how a village would like to prevent and resolve conflict and also preserve their environment.
 243. Tara Bandu is generally used to prohibit certain unsustainable practices, such as hunting, fishing, cutting trees, and harvesting crops, during certain periods of the year to allow the land to naturally renew itself. The customary law also allows a community to deal with conflicts within the community such as land disputes, as well as social problems at the household level.
 244. The process of Tara Bandu is a process of coming to a communal agreement or social contract that outlines the behaviors and practices that members of community deem to be appropriate and want to enforce. As such, the legitimacy of Tara Bandu is largely dependent on the decree of local level consultation and engagement in the generation and consecration of the terms of this communal accord. Punishment for breaking the condition of a Tara Bandu can take the form of both physical sanctions and abstract 'supernatural' repercussion, such as spells cast upon those who contravene the regulation of Tara Bandu depending on the cultural context.
 245. The customary physical representation of a Tara Bandu is a wooden pole, strategically placed in a village or hamlet, with parts of plants and animal remains attached to it. It is a symbolized on the pole is protected within a certain area for a time period. Tara Bandu can also be put on where the ban is placed. Normally it would be placed a strand of a certain grass or plant on the pole so that the exact location will be known precisely.
 246. Implementation of Tara Bandu has also involved the formal structure of the government. At the village level, Suco Chief is the key authorized person for Tara Bandu implementation together with the operating customary leaders. It is noted that concerns have been raised that reliance on Tara Bandu can have the indirect effect of excluding women participation at local decision-making process as the vast majority of customary leaders are male. Tara Bandu consequences include the payment of fines through the provision of animals and other assets recognized by local community and culture. Limited accountability systems to enforce Tara Bandu rules can cast shadow on its long-term use when efforts are not stepped up to promote increased accountability mechanisms. Tara Bandu on forest land is implemented and monitored by forestry officer (forest ranger) representing the Government of Timor Leste.
 247. The government of Timor-Leste has also established a new directorate to support and strengthen the traditional custom of Tara Bandu to protect and conserve natural resources in order to achieve environmental sustainability, as well as a means to build trust within communities, and resolve conflicts. This would include the application of Tara Bandu at a wider spectrum which is already being implemented by the government staff as an instrument to build social capital.
 248. There are two Civil Society Organizations i.e. KSI and Haburas that provide support and advocacy for the revitalization of this custom in other parts of the country and encourage its implementation at the national level for peace and trust building, and to foster social and environmental sustainability. Development partners also acknowledge the importance of Tara Bandu particularly in its ability to preserve and resolve conflict at the

community level as they relate to community-based resource management. While reviving Tara Bandu for environmental protection may be welcomed and has brought about relevant impact when implemented efficiently, Tara Bandu should not be used for gender-based violence protection. The use of community-based conflict resolution mechanisms reportedly fails to ensure equal participation of women, is not GBV victim centred and thus often impacts negatively on a survivor's access to justice. Most gender-based violence offences constitute a public crime which legally have to be handled through formal justice system, not through customary practices such as Tara Bandu.

g) Indigenous People/Ethnic Minority and Cultural Diversity

249. It is clear from the constitution and national vision statement that in developing the new nation, the government has ensured that any differences existing between Timorese people due to language, religion, ethnicity would be respected, valued would be preserved within the framework for establishing equal and universal rights for all Timorese.
250. Screening and identification of indigenous people and other ethnic minority or vulnerable groups in the project area was conducted during initial field assessment and further explored during Public Consultation held in September 12 – 26th 2018.
251. Consistent with the World Bank OP. 4.10, the term “Indigenous Peoples” is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:
- a) Self – identification as members of a distinct indigenous cultural group and recognition of this identity by others;
 - b) Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
 - c) Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
 - d) An indigenous language, often different from the official language of the country or region.
252. No community groups with Indigenous Peoples characteristics were observed in along the proposed road corridor where road upgrading works are currently being planned. The screening assessment indicates that while Suco communities who reside along the road corridors still preserve some forms of allegiance to their kinships and observance to traditional systems and institutions, these communities represent the dominant group in the region. Hierarchical traditional governance structure appears to have still existed and been respected such as in Estado, Eraulu, and Gullolo. No ethnic minorities nor traditionally distinct groups or with collective attachment to geographically distinct habitats or ancestral territories were observed in the entire road corridor.
253. Land and its associated properties are mostly privately-owned, although there are some cultural sites (i.e. Uma Lulik) that are collectively owned by Suco communities or families. The majority of the communities in Section 2 primarily consists of settled rural agriculturalists, with coffee being the main commodities. Whereas in Section 3, a mixed group of rural and peri-urban populations were observed and coffee farming, small-enterprises (i.e. kiosks, food stalls) and trades jobs represent the main livelihoods sources. Tetum, which is a lingua franca in Timor Leste, is the main language spoken in the region.

h) Religious Practices

254. East Timor has been nominally Catholic since early in the Portuguese colonial period. Catholicism became a central part of Timor-Leste culture during the Indonesian occupation. Across the country, religious traditions, rituals, and ceremonies are widely practiced with Christian holy days and festivities such as Easter, Christmas, all saint's day, and the Immaculate Conception. The Constitution of Timor-Leste protects the freedom of religion in the country, and the GoTL respects such rights.

i) Social Audits

255. A social audit, which represents a new initiative by the former Prime Minister H.E. Dr. Rui Maria de Araújo was undertaken to the Road for Development Program (or hereafter known as R4D) in the Municipality of Manufahi. Such a social audit was carried out by NGO Luta Hamutuk, with support from the Asian Foundation (TAF) and Timor Leste NGO Forum (FONGTIL). The overall social audit process took about five months to complete.
256. Under the R4D project, community involvement was sought in the form of labor for road maintenance. Typical chores include mowing grasses and vegetation, cleaning drainages and filling up potholes. Employment is divided on the basis of seasons. During the dry season, each person is allocated 12 days and 24 days during the wet seasons. Each group consists of five people and mostly is composed of women. Payment is USD 5 per-kilometer and is paid on the basis of performance.
257. Key aspects that were highlighted as part of community and stakeholder consultations during the social audit include a) terms and conditions of contracts for community workers were often not fully understood, often resulting in misunderstanding and expectations, for instance upfront wage payments; b) payments were occasionally delayed despite the works performed; c) there were also reports on contract irregularities. Community meetings were perceived as an avenue to enable collective oversight as well as community participation in municipal development processes. Generally, road maintenance also has been perceived to benefit the wide public, especially students, by ensuring that accessibility is maintained all year round.

7. Alternatives

258. There are three alternatives were proposing for rehabilitating and upgrading of the Branch Road Section of Dili – Ainaro; start from Aituto – Hatubuilico – Letefoho – Gleno which about 60 Km. Alternatives to road rehabilitation have been considered include “without Project” alignment and transport modes.
259. The “without Project” alternative will not address the Government's vision for rehabilitation of national roads. The “without Project” option is not recommended as the road is less feasible to pass through; thus, “without Project” would hamper economic and social development objectives. Even if no direct cost would be incurred, the disadvantages of the “without Project” option are: (i) traveling time and transportation costs will remain costly and may likely increase as the road deteriorates; (ii) tourism access and marketing of agriculture production disrupted; (iii) increased risks of traffic accidents (iv) community health and safety risks due to dusts especially during the dry seasons;
260. Three road improvement alternatives that possible to apply have been considered. The 1st alternative was the rehabilitation of existing carriageway to improve the roads to an acceptable condition, followed by appropriate drainage systems and slope stabilization. Rehabilitation only applies for Section 1 (Aituto – Hatubuilico) and Section 2 (Hatubuilico – Letefoho), whereas Section 3 (Letefoho – Gleno) proposed for upgrading to the National Road Standard. The environmental and social assessment indicated that limited improvement and minor realignment in the selected section will not have significant impacts compare to the original design.

261. The 2nd alternative consisted of improving and asphalt paving that refers to National Road Standard, with 0.5 m shoulders on both sides. This alternative applied to Section 2 (Hatubuilico – Letefoho) and Section 3 (Letefoho – Gleno). Meanwhile, Section 1 (Aituto – Hatubuilico) only covers rehabilitation of existing carriageway with an appropriate drainage system and slope stabilization. Generally, the existing road condition of Section 2 and Section 3 has been widened, especially for Section 3 which has been widened up to 9 – 12 meters through the on-going construction by Government of Timor-Leste through the “Emergency Project”.
262. The result of environmental and social assessments for the 2nd alternative does not indicate significant and irreversible impacts as additional widening will be limited to specific areas requiring road curve improvements and alignment adjustments to meet minimum ROWs and road safety aspects.
263. The 3rd alternative consists of the improvements of all sections (Aituto – Hatubuilico – Letefoho – Gleno) into the National Road Standard, with a total carriageway of at least 9 meters. The road condition of Section 1 was generally a built infrastructure which part of it traverses protected areas and important birds’ areas, though it does not appear to be a primary forest anymore. The proposed Project is not envisaged to create adverse impacts on the natural resources as well as impacts on cultural/heritage sites, and neither does it pass through densely populated areas or an area subject to heavy development.
264. The scope of potential environmental and social impacts of the 3rd alternative is likely limited to the direct footprints along the corridor and associated facilities. Adverse environmental and social impacts are expected to be predictable and manageable with the completion of the SEIS and the proper implementation of the ESMP and CESMPs. Most of the anticipated impacts likely occur during pre and construction phases, and these are related to the physical, biological and socio- economic aspects as a result from land acquisition, asset removal and resettlement. Construction-related impacts are limited to air such as dust and noise, water quality, soil contamination, health and safety concerns, tree felling, spoil and waste disposal, including traffic interruption and impacts on existing properties and public facilities. Post construction impacts are mostly downstream, and these are likely associated with road safety risks which will be addressed through road safety measures under the BRP.
265. Existing conditions of the Aituto – Hatubuilico – Letefoho – Gleno roads are still unfavorable in many places and most of the road are sealed by shoddy gravel, except on Section 3 (Letefoho – Gleno) which is still under an on-going construction through the GoTL’s “Emergency Project”. This proposed Project is expected to benefit the communities by enabling more efficient and safe travels through improved road conditions. Repairs and asphalt pavement will also reduce dust. Repairs and cleaning of the drains and culverts will reduce flooding risks and preserve the improved conditions of the road. Meanwhile, measures for slope stabilization will prevent any slope failure or landslides.
266. Given the above assessment, the GoTL proposes to upgrade the roads in Section 2 and 3 to National Standards.

8. Climate Change

313. Increasing climatic variability and unpredictability, particularly in relation to rainfall and extreme weather events, present a very significant additional risk to the lives and livelihoods of rural people, particularly those living in remote areas of Timor-Leste. Such risks include increased flooding and landslides affecting critical rural infrastructure which have overtime degraded the intended function of such infrastructure, particularly water supply, drainage, embankment and river protection structures, and community level feeder roads and bridges that connect the network of national and district roads with rural roads. Therefore, the initial objective of the Road Climate Resilience Project for Timor Leste is to invest in the key road infrastructure to reduce the impact of the high

volume and intensity of rainfall on the road corridor.

314. Erosion is a serious problem in Timor-Leste due to steep topography, shallow soils and loose geological sedimentation. The shallow soils, especially on the steep topography, result in a lack of vegetation cover that increases runoff and provides little protection against erosion. The steep topography increases runoff and reduces the time of concentration for individual catchment, and poorly consolidated soils are susceptible to erosion due to the age of the geological formations. The increased runoff due to the higher precipitation and the shift in precipitation from the drier months to wetter months tends exacerbate the problems. The main impacts of the increased erosion will be higher sediment loads and the risk of damage to the drainage system due to the increment of sediment deposition in the drainage system.
315. The intensity of short duration precipitation events and increased runoff represent a significant concern in this proposed Project. When the intensity of short duration rainfall events increases, runoffs significantly increase in small catchments. An important impact of this hazard is an increased flooding incidence due to an insufficient hydraulic capacity of the longitudinal and transverse drainage systems. While the extent of the flooding may be small, the impact of the flooding is significant in the area inundated. The main impacts are increased erosion, safety issues associated with water on the carriageway and weakening of the pavement due to saturation. The increased erosion will arise from the higher volume of runoff.
316. There is research on climate projections conducted by PACCSAP (Pacific – Australia Climate Change Science and Adaptation Planning) and builds on the findings of the 2013 IPCC Fifth Assessment Report and uses new emissions scenarios and climate models. The Climate projections for mid-century suggest in Timor-Leste are as follows:
- Increased temperature of 1.25° - 1.75°C by 2050;
 - Increased duration of heatwaves;
 - Increased rainfall of 4 - 10 % by 2050 with an increase of up to 100 - 120 mm in coastal areas and 260 - 300 mm in the mountains;
 - Increased intensity of heavy rainfall events, but decreased frequency;
 - Increased sea surface temperatures of 0.6° - 0.8°C by 2030;
 - Rise in sea level by 150 - 340 mm by 2050;
 - Increased cyclone intensity (higher wind speeds) but decreased frequency.
317. The climate projections showed increased intensity of heavy rainfall events, though there is decrease of frequency which will affect rainwater that induced geologic processes such as erosion and sedimentation. Increased rainfall intensities can translate to fewer events but higher magnitudes of landslides and erosion and siltation. These conditions have been anticipated and considered in the rehabilitation and upgrade plan such as improvement of road's alignments, installation of retaining wall to prevent landslides, and including culverts size have been increased to accommodate increased flow and sedimentation.
318. Some adaptation strategies have been developed for each significant infrastructure risk. These strategies focus on protecting the infrastructure from the hazard environmental impacts resulting from climate change. The strategies involve a combination of technical and maintenance works to ensure a reliable and safe transport link.
319. The following strategies have to included in the detailed designs to combat more intense short duration precipitation in the area identified as vulnerable.
- a. Increase capacity of transverse drainage system: the intensity of heavy precipitation events increases; the capacity of transverse drainage system will be increased by providing additional culverts and replacing existing culverts with a larger one.
 - b. Improved longitudinal drainage: the ability of a longitudinal drainage system to

- accommodate the higher quantity of run-off due to the higher precipitation rates will be improved by lining drains and providing a larger dimension of the culvert.
 - c. Erosion and landslide protection: areas adjacent to the road which risk of erosion and prone to landslide, will be protected using a combination of physical and bio-engineering techniques.
 - d. Increased maintenance: the quantity of maintenance is increased in response to the faster rate of physical deterioration.
320. Project activities will not cause any measurable climate changing effects. However, the emissions from the project activities and equipment will be controlled in line with best international practice and no burning activities are allowed.

9. Impact Assessment & Mitigation Measures

9.1 Introduction

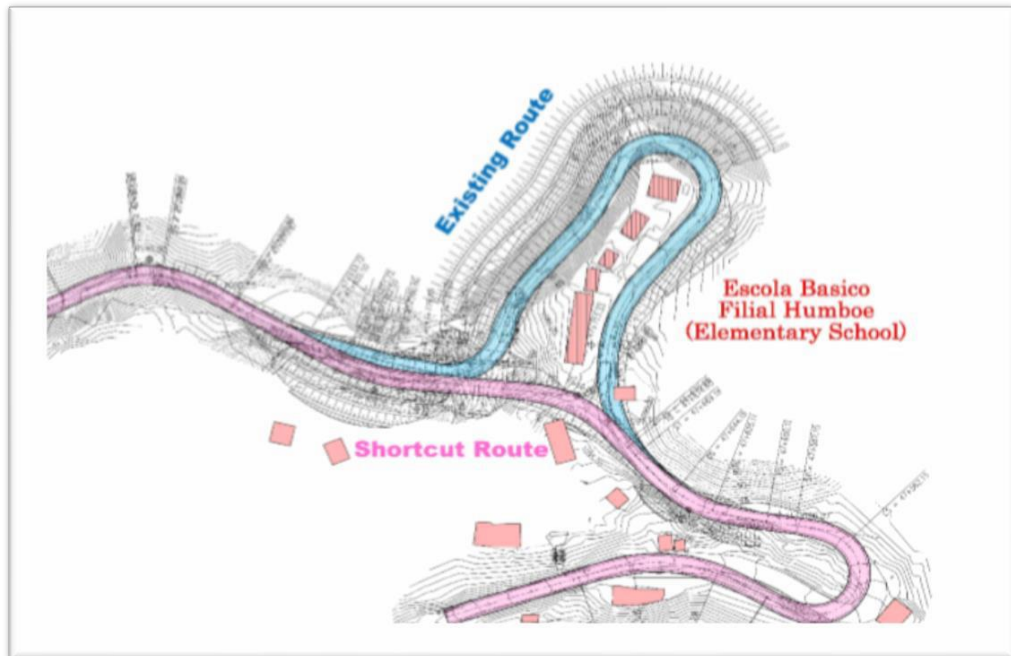
321. The impact scale determination will depend on (i) spatial scale (site, local, or regional); (ii) time horizon of the impact (short, medium, or long term); (iii) magnitude of the environmental component change affected by the Project activities (small, moderate, large); (iv) importance to local human populations; (v) compliance with international, national, provincial, or municipality environmental protection laws, standards, and regulations; and (vi) compliance with guidelines, policies, and regulations of Timor-Leste and World Bank policies.
322. Mitigation measures developed to minimize or reduce potential major negative impacts up to acceptable level once identified. When the mitigation is not possible, major negative impacts can trigger further detailed environmental and social impact assessment. There are several types of impact to be considered such as direct impacts caused by Project activities and occur at the same time and place during both Project construction and operation. Whereas indirect impacts are impacts on the environment which not a direct result of the Project, and often produced away from or as a result of a complex pathway. Cumulative impacts include a range of impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the Project.
323. The short-term environmental impacts, when their changes in the environment are usually temporary, for instance, the noise and fumes associated with heavy equipment occur during road construction. Meanwhile, long-term environmental impacts mean when there is a change that can affect the organisms but either takes a long time or lasts a long time and could affect regional land use and development patterns, lead to permanent loss of unique and sensitive habitats and even population mobility and migration.
324. The significance of the environmental impacts is an important reference for formulating environmental impact mitigation measures. The mitigation measures will follow the hierarchy i.e. avoid, minimize, rectify, and compensate to achieve break-even point with no net loss.
325. The Project is limited to relatively medium-scale road upgrading works with additional maintenance and bridge construction works. There is little scope for long-term environmental impacts arising from such works and measures in the project area. Impacts caused during construction activities are dependent on number of factors including a) temporary use of land and its rehabilitation post-construction; b) best practices applied during construction activities; c) coordination and cooperation with local authorities in terms of impact management; d) strict enforcement of environmental clauses and conditions included in Project bid documents, the contract and technical specifications; and e) adherence to the ESMP contained in the SEIS/ESIA and Construction Environmental and Social Management Plan (CESMP) prepared by the Contractor and submitted to and reviewed by PMU.

9.2 Impact Avoidance

326. Efforts were made to minimize potential resettlement and road safety risks associated with the project activities. This was done through adjustments in the proposed alignment and rerouting. Once the DED for both sections 2 and 3 have been completed, further review will be made to understand safeguards implications of the proposed design. At the writing of this SEIS/ESIA, some impact avoidance made through engineering design is summarized as follows:
- a. **Shortcut route at Humboe School zone;** Humboe elementary school is surrounded by a narrow existing road and hence widening of the road section in front of the school will prevent future expansion of school infrastructure. In addition,

it is expected that future traffic volume will increase due to the improvement of project road, which presents a major traffic safety risk for school children. At the request from the communities and school administrators, rerouting was introduced in the DED to avoid impacts (see Figure 9.1);

Figure 9.1: Shortcut Route at Humboe School Zone



- b. **Shortcut Route at Goulolo Suco;** Goulolo Suco community has requested a road re-alignment to avoid potential impacts on historical sites *Uma Lulik* located uphill. According to the community in Goulolo Suco, there are concerns that construction activities, including slope cutting and operations of heavy vehicles may compromise the structure of such historical sites. Rerouting to another existing road section was introduced in the DED and assessed to be technically feasible although land acquisition for road widening is anticipated (see figure 9.2). Potential social and environmental impacts have been assessed as insignificant.

Figure 9.2: Shortcut Route at Goulolo Suco



- c. **Letefoho Church Service Road with installed sidewalk;** The Letefoho Church administrators and community representatives from Suco Haupu requested alternative design to minimize footprints of the proposed road road upgrade. Underground culverts will be installed to minimize land requirements and in addition, a paved sidewalk with a guardrail will be built along one side of the road section to minimize road safety risks during church services. The church's service road will be upgraded and will serve as an alternative route to divert traffic during peak times (see Figure 9.3).

Figure 9.3: Letefoho Church Service Road



9.3 Pre-Construction Phase

327. Activities during the pre-construction phase are limited to the following activities: census of PAPs and their assets, demarcation of road corridors, land acquisition, in-situ resettlement of PAPs, site clearance (i.e. structural and vegetation removal), digging and excavations and contractor mobilization. The following provides an impact assessment during the pre-construction stage, which consists of:

A. Social Disruption

328. The proposed rehabilitation Project will be carried out within the existing road, however, there is road realignment to improve the curve, hence, land acquisition and resettlement impacts are expected. For this purpose, land acquisition and resettlement impacts need to be identified and mitigated in a consistent and transparent manner. A separate Resettlement Policy Framework (RPF) has been prepared in line with the World Bank's OP 4.12 on Involuntary Resettlement.
329. Measures to be applied to minimize the social impacts of the Project, include:
- Works will be restricted to the "right-of-way" of the road design;
 - Projected impacts and negotiation of the proposed measures have been discussed in advance with the affected community; work with local government officers and non-governmental organizations to facilitate consultations and negotiations with PAPs;

- Conduct surveys before activities commence to identify all members of affected populations, and identify other land-based natural resources, infrastructure, and services that will be lost to the affected community;
 - Identify suitable land in-situ (to the extent possible land, retaining the same clan ownership) for resettlement/re-establishment of structures.
330. Land acquisition and resettlement activities may cause anxiety to the community when the process of land acquisition and resettlement is not conducted in a transparent manner, hence Suco-level consultations will need to be revisited and proper engagement with Suco representatives will need to be built prior to any construction activities. Identification and inventory of losses will need to be revisited through such consultations, which also include validation and negotiation on compensation rates for lands and assets of the community.
331. Social disruption may likely happen as well during mobilization of the contractor to the project site, especially when Contractor mobilizes workers who are not from the local community or residents of sucos in the project area. In order to minimize the impact, the selected contractor should conduct coordination with the chief of suco and other stakeholders in the project area, prior to mobilization to the site, as well do a consultation with the community as per Project's Communications Plan.
332. Mitigation measures proposed to the social disruption due to land acquisition and involuntary resettlement i.e. consistent and transparent process during identification, validation, and negotiation, following up with cash compensation for the land acquisition or assets, and resettlement for the housing lost.

B. Land Acquisition and Impacts on Structures

333. The project will acquire some 27.10 hectares of land for the construction of the Branch Road for all sections. Out of the total impacted land, there are approximately 12.06 hectares of agricultural and, 3.66 hectares of residential land, 10.85 hectares of vacant land and 0.67 hectares of government and church land. No communally and/or customarily-owned land and commercial land owned by companies will be affected by the proposed Branch Road. There are 248 households (AHs) will be directly impacted by land acquisition of the Branch Road. Based on land used type, 140 PAPs will be affected from acquisition of 8.46 hectares of cultivated land; 42 PAPs of fallow shifting agriculture land; 37 PAPs of resident/compound land.
334. On the basis of severity of impacts, road widening in Section 3 is predicted to result in more impacts compared to other sections. In terms of types of impacts, impacts on residential land are expected to be more significant in Section 2 compared to other sections. Whereas in Section 3, impacts on agricultural land, particularly coffee plantations, are expected to be more significant compared to other sections. However, since the DED for Section 3 is currently being prepared and the on-going GoTL's emergency road construction (refer to Tracer Assessment in the ESIA and Land Acquisition and Resettlement Action Plan/LARAP) is yet to be completed, impacts will likely change and hence, need to be revisited.
335. There are different categories of private structures impacted, including residential and commercial (i.e. kiosks, workshops), which may be located within the existing ROWs or private land which will be included as part of the proposed Branch Road right of ways (ROWs). Another category includes public structures which cover government buildings (i.e. Suco offices, schools) as well as church-owned properties.
336. Impacts on private structures include partial and full removal of houses, kiosks, workshops and ancillary structures such as garages, kitchens as well as fences and retaining walls. Structures are both permanent and semi-permanent and all PAPs will be

- compensated at replacement costs. Compensation packages for those who need to be relocated in situ cover cash compensations for land and structures affected (and whole structures in the event that they can no longer be used), construction assistance at 30 percent of the overall structure compensation and transitional assistance. Those owning semi-permanent structures, compensation values have been set to enable affected structure owners to build back better. Calculation of compensation values, and livelihoods assistance particularly those whose livelihoods will be disrupted as a result of the construction activities is further provided in project's LARAP.
337. Impacts on residential structures: potential impacts tend to be more significant in Section 2 where 12 HHs (105 PAPs) are anticipated to be relocated in-situ. In section 1 and 3, two HHs (22 PAPs) and seven HHs (47 PAPs) are anticipated to be relocated in situ respectively. Engineering design is currently in the process of finalization for Sections 2 and 3 and impact avoidance considerations, particularly to minimize resettlement impacts in Section 2 are currently being developed.
338. Approximately 1,392 sqm of permanent houses and 372.98 sqm of semi-permanent houses will need to be removed (both partially and fully). However, since such structural demolition will compromise building safety, these houses will hence need to be fully demolished and owners will be compensated at replacement costs for their affected structures and land.
339. Impacts on commercial structures: The project will affect a total of 25 commercial structures, which is composed of permanent (6) and semi-permanent kiosks (17) and two semi-permanent mechanical workshops. 11 of semi-permanent kiosks are movable and hence will result in minimal impacts.
340. Impacts on livelihoods associated with removal or moving of kiosks and mechanical workshops are expected to be temporary. Owners will be provided with temporary allowance of 100 USD each month for three consecutive months to enable them to rebuild their commercial structures and recover their economic activities. Impacts during construction are expected to be positive due to a potential increase in trades of basic foods and goods with the presence of construction workers.
341. Impacts on public facilities: Public facilities include two water tanks, 200 meters of water pipes, one multi-function classroom room, 51 electric poles. These utilities/facilities will need to be rebuilt or relocated. The project will provide complete restoration/rebuilding costs as well as replacement costs for these entire utilities. As part of the project's Environmental and Social Management Plan (ESMP), these utilities will need to be fully relocated and/or replaced prior to any land clearance or construction works to minimize activity and service disruption. Such relocation and/or replacement will be coordinated with respective agencies responsible for the maintenance of these utilities/facilities and all replacement costs will be borne by the GoTL.
342. Impacts associated with land acquisition and removal of structures are addressed in the LARAP, which serves as an integral instrument for the management of the overall environmental and social risks.

C. Increased Landslides and Damage

343. The proposed Project objective is to rehabilitate and upgrade road network between municipality and town including support climate resilience of Dili – Ainaro road. Therefore, climate change resilience action need to be prepared such as constructing leveling of earth mass with rip-rap protection for roads at risk of erosion from extreme waves; providing larger drains and additional culverts to accommodate the larger quantities of runoff; re-forestation or re-vegetation on unstable slopes, e.g., planting around 500 trees per hectare; and applying vegetated erosion control blankets, which

consist of natural fibers able to retain soil and sediments.

344. Introducing climate change resilience measures under the project represents a positive impact since these will protect roads prone to erosion, unstable slopes, and accommodate runoffs. However, construction works for larger culverts, leveling earth mass with rip-rap might increase landslide risks on several areas and cause damage to the existing road infrastructure.
345. Incorporating climate change adaptation measures into the detailed design is instrumental as part of the mitigation measures during the pre-construction phase. Such measures are aimed to minimize landslide risks and resulting road damage during the construction phase.
346. Slope failure and landslides are also anticipated as a result of land clearing, slope cutting, and excavation activities. Therefore, visual and technical inspection by the Project Implementation and Supervision Consultant should be conducted regularly and if needed retaining walls will need to be installed in some of the very sensitive areas. These measures will have to be reflected in the DED to the extent possible.
347. Previous road project experiences showed that there is likelihood of slope failures during slope cutting activities, resulting in slope ruptures and landslides. It is noticeable in several sections; secondary vegetation growths have covered past slope failures. The first critical mitigation is to avoid impacts by designing slope cutting based on the classification of soil and rock characteristics. Similar to the above, such identification will need to be reflected in the DED.
348. Key important measures to minimize landslides and slope failures include construction of catchment walls and embankment at the foot of the slopes. In this case, the height of the walls should be considered for the elevation of 45° from the top of the wall, and the embankment structure should be decided based on factors such as slope condition and geological structures.
157. In addition to bio-engineering with grasses, other mitigation measures include reforestation and protection of areas adjacent to roads in order to reduce runoff velocity and enhance retention of soil as part of erosion control program in the project area of influence. The bioengineering scope of work covers grass planting, bush layering and tree planting. The Contractor is required to have a nursery or purchase the trees from locals.
158. PMU has adopted Guidelines on Soil Bio-Engineering Practices for Roadworks and Slope Stabilization-August 2017 in which the proposed list of species are natives and listed as an annex of the guidelines.
Most commonly used native plants include:
 - Seedling: Ai-kafe (*Leucaena leucocephala*), Ai-kakeu (*Casuarina junghuhniana*)
 - Hardwood cutting: Ai Amare Fuik (*Spondias* Spp), Madre de cacao (*Gliricidia sepium*)
 - Grass: Soko grass (*Themeda* species)

D. Physical Cultural Resources

349. Activities of site clearance and digging that were undertaken during pre-construction can produce discoveries of physical cultural resources, including archaeological and mass grave sites. In the event this occurs, work shall cease immediately, and the relevant authorities shall be informed. Activities shall not recommence until the authorities have signed-off that the sites/resources have been dealt with appropriately and that work may continue.
350. The Contractor shall be responsible to comply with the requirements of authorities and shall be monitored by the PMU. The contractor will include a section on “chance finds” in the Construction Environmental Social Management Plan (CESMP). Mitigation measures for potential impacts on physical cultural resources include:

- Site agents will be instructed to keep on an eye on relics in excavations and do a consultation to the community, especially customary leader on the site;
 - Should any potential items be located, the PMU will immediately be contacted, and work will be temporarily stopped in that area;
 - The Project Management Unit (PMU) with the assistance of the Project Implementation and Supervision Consultant (PISC) will determine whether there is potential significance and contact MPW to pass the information to the relevant department in GoTL (i.e. State Secretary of Art and Culture) who will be invited to inspect the site and work will be stopped to allow time for inspection.
351. During a survey of the presence of physical cultural resources (PCRs), a horizontal cave (STA 3+560) was identified. This cave, which has cultural values for communities in Horaic-Quic and Mulu Sucos, may be at risk of being impacted by the road widening activities. However, this cave is located within Section 1 which is currently outside the scope of the project. Further detailed assessments on PCRs as well as implementation of chance finds procedures during construction will be required to ensure that potential impacts on unidentified PCRs are well managed and to the extent possible, avoided. The scope of such assessments will also cover karsts and other geological features that may have biodiversity, socio-cultural values to the country, and particularly amongst affected communities.
352. When the relevant authorities in the Government of Timor-Leste has not provided a greenlight, any physical work cannot be resumed in this location until an agreement has been reached between GoTL and PMU with regards to required mitigation measures, which may include structured excavation and phased construction.

E. Vegetation Removal

353. Site clearing, and excavation works may affect some trees, hence attention will be given during the preparation of the detailed design for the road sections, especially on the natural environment to minimize effects on trees and crops. Suggested measures to achieve this objective are:
- Conduct a topographic survey and reflect trees and vegetation on maps. This will support the Design Engineers in avoiding trees and vegetation;
 - Coordinate with the National Directorate for Environment, Forestry, and Agriculture to determine their requirements relative to tree cutting;
 - Locate potential construction sites with minimal effect on trees;
 - Ensure construction personnel are aware of endangered species and their habitats;
 - In a situation where the proposed construction will pass close to these areas, shall provide safety signs to confine machines and activities;
 - Inspect quarry and gravel extraction sites and ensure that appropriate permit will be obtained prior to construction activities.
354. Vegetation removal during site clearance has to be based on the schedule of trees to be cut made by the Contractor. Plans for the removal of trees and vegetation have to be incorporated in the CESMP, including revegetation/replanting (if required), incorporating with owner consultation and compensation per Resettlement Plan (RP).
355. The census survey indicates that impacts on agricultural crops are more severe in Section 3 (i.e. approximately 19,238 coffee trees need to be removed for the purpose of road widening) and hence, may warrant further considerations with regards to mitigation measures associated with livelihood impacts. In total, there will be approximately 27,652 mature coffee, 517 timber and 1,055 fruit trees that will be impacted. Compensation for tree owners is further described in the project's LARAP on the entitlement matrix. As part of safeguards measures, replanting assistance will be offered to tree owners in addition to compensation payments and livelihoods assistance.

356. Impacts on livelihoods as a consequence of productive tree losses are addressed in the project's Land Acquisition and Resettlement Action Plan (LARAP), which is an integral instrument for the overall management of environmental and social risks.

F. Community Health and Safety

357. Contractor mobilization, which includes activities such as initial establishment of a site office, works yard and work sites will require to interaction between local people and construction workers. Hence, prior to Contractor mobilization to the site, PMU will work with the Contractor to establish the communications protocol between the Project and communities as per Contractor's Communications Plan in the CESMP. The Contractor will designate two members of its staff to be the liaison between the suco chiefs, customary leaders, and Contractor as well as between the Contractor and PMU as per communication process identified below.
358. The establishment of the site office, work yards and work sites may have implications on community and health safety, which may stem from sanitation, exposure to chemicals and leakages/seepages, social contacts with construction workers. Furthermore, there may be risks that the presence of outside workers may crowd-out the availability of local services. The degree of such potential risks and impacts will vary and greatly depend on the number of outside workers across construction cycles.
359. Previous road construction experiences in Timor Leste indicate that there could be around 250 temporary road construction workers to be mobilized at a time by a contractor for one road section (for a length on average 25 km). Most of these workers are usually locally outsourced from the affected Sucos and employed to perform semi-skilled and non-skilled works. Road engineers and skilled workers are usually foreign workers, with a typically a smaller ratio to the overall workforce (one fifth). These foreign would typically reside in an enclosed camp near the construction site. While the overall number of foreign workers appears to be relatively small than bigger construction projects, the presence of construction workers concentrated in specific sites over an extended period (can be up to 30 months) present potential environmental and social implications that are considered in this section
360. Required mitigation measures for the contractor cover adoption of good management practices to control fuels and chemicals spillage, and monitor that raw sewage, wastewater effluent, and construction debris/unused material will be disposed of in controlled conditions to reduce the risk of contamination. Measures to minimize disturbance by construction workers in the host communities include:
- Suco protocols discussed with workers as part of awareness and mobilization training. Hire and train as many local workers as possible by using labor from each suco as the work proceeds from suco to suco;
 - The Contractor must ensure that workers' actions outside the work site are controlled and Suco codes and rules of conduct are always observed;
 - Provide adequate housing for all workers at the construction/worker camps and establish clean canteen and cooking areas. Contractors shall ensure separate housing and sanitary facilities for men and women and reasonable accommodation made for persons with disabilities. Worker camp location and facilities should be located at least 500 m from settlements and agreed with local communities and facilities approved by PMU and managed to minimize impacts;
 - Adequate road safety signs and security provided at the site office and works yards and prevention of unauthorized people (especially children) entering the area;
 - Construction camps will be established in areas with adequate drainage to prevent water log to the camp and formation of breeding sites for mosquitoes; as well to facilitate the flow of the treated effluents;
 - Provide potable water, clean water, hygienic sanitation facilities/toilets with enough

water supply, rest area, and first aid facilities. Separate toilets shall be provided for male and female workers, with bins to dispose of sanitary napkins and sinks or buckets and running water for washing reusable cloths available for female workers;

- Access for workers with disabilities to facilities (reasonable accommodation measure) should be envisaged, in dialogue with a Disabled Persons Organization (DPO) present in the area;
- Portable lavatories (or at least pit latrines in remote areas) shall be installed and open defecation shall be prohibited and use of lavatories is encouraged by cleaning lavatories regularly and by keeping lavatory facilities always clean;
- Wastewater effluent from contractors' workshops and equipment washing-yards will be passed through gravel/sand beds. All of oil/grease contaminants will be removed before discharging it into natural streams. Oil and grease residues shall be stored in drums awaiting disposal in line with the agreed waste management section of the ESMP;
- Predictable wastewater effluent discharges from construction works shall have the necessary permits from DNCPIA and local authorities before the works commence;
- Food shall be provided from farms nearby or imported to the area. Bushmeat supplies from protected areas will be banned to discourage poaching. Solid and liquid wastes will be managed in line with the provisions of the waste management section of the ESMP;
- The use of hunting equipment or gun by workers will be banned. Workers will be dismissed for taking or using green timber or hunting or being in possession of wildlife. Workers banned from entry to the protected, IBAs and/or sensitive areas;
- Provision of adequate protection to the general public in the vicinity of the work site, including advance notice of commencement of works, installing safety barriers as required by villagers, and safety signs or marking of the work areas;
- Workers should respect village and land owner's boundaries all times, recognize and follow village rules and terms of conduct, including those addressing women and elders;
- The community should be prevented from spreading of the communicable disease, hence needs to implement HIV/AIDS/STIs awareness and prevention for the Contractor's workers and adjacent communities; and
- Land used for the construction campsites shall be restored to the original condition as far as practicable and the area shall be planted with appropriate trees as soon as practicable after it is vacated and cleaned.

9.4 Construction Phase: Impacts on Physical Environment

a) The decrease in Air Quality

349. During the construction phase of proposed Project, there is likelihood of temporary impacts on local air quality through emission of exhaust from construction vehicles and aggregate crushing plants; as well as through dust generation from vehicles transporting materials and from exposed stock- piles of construction materials.
350. Slope cutting, excavation, and rock crushing activities will be the main sources of dust. The works in any road section will generally be of short duration and in several locations, there will be sufficient buffer distance such that no significant impact is expected from the construction works on residential sensitive receivers in terms of noise, vibration, and dust. In addition, works will not take place at night except in special circumstances justifiable to the PMU.
351. The road improvement will result in the reduction of dust dispersion as a result of proper compaction and treatment of the road surface. There are a number of good engineering practices that can be applied to ensure that any air quality impacts generated during

construction are mitigated, as following:

- a. Construction equipment maintained to a good standard. The equipment will be checked at regular intervals to ensure they are maintained in working order and the checks will be recorded by the contractor as part of environmental monitoring;
- b. Prohibition in using equipment and machinery that causes excessive pollution (i.e. visible smoke) at the project site, following with periodic qualitative air quality monitoring;
- c. Material stockpiles in sheltered areas and to be covered with tarpaulins or other such suitable covering to prevent material create airborne and runoff of fine particles;
- d. During transportation, should ensure that all vehicles transporting potentially dust-producing material are not overloaded, are provided with adequate tail-boards and side- boards and are adequately covered with a tarpaulin (covering the entire load and secured at the front, sides, and tail of the vehicle);
- e. A sprinkling of water on the road, where work is in progress within 100 m of the sucos along the road and any roads being used for haulage of materials, during the dry season shall take place several times a day.

b) Erosion and Flood Event

352. Along the project site, there are perennial and seasonal rivers that traverse or parallel to the existing road. When the rainy season cannot be avoided and while culverts are required, there could be the need to temporarily constrict water flows and dry out sections of rivers or streams depending on their size and water volumes carried, in order to place new structures. These activities can result in a risk of channel shifts and erosion, particularly of river banks that would lose their vegetation cover, most particularly during floods.
353. Erosion and flood event can occur as impacts of land clearing, grubbing, cut-fill activities, and construction. Natural streams may be silted and flood due to runoff from the land clearing, borrow pits and grubbing for the side drain construction. Meanwhile improperly soil disposal on the steep gorges, devoid compaction and blocked the existing cross-drainage system will prone to erosion during a hard rain.
354. The Contractor will be required to implement the CESMP and to provide drainage facilities to avoid stagnant water or flood within the Project site, construction camps, borrow/quarry areas, other areas used for project-related activities and adjacent areas. In areas close to the sensitive receivers, the Contractor will provide appropriate drains so that the outfalls of the surface run-off from the carriageway are diverted away from the sensitive receivers. Measures will also be taken by the Contractor during the construction phase to ensure that storm drains and road drainage systems are regularly cleared to maintain stormwater flow.
355. Potential impacts of erosion and flood will be mitigated by:
 - a. Material stockpiles will not be located within riverbanks or the area of river floodplain in areas subject to regular flood (once per year or more). All land used for stockpiles will be rehabilitated to its original or better condition upon completion of the works;
 - b. Source protection will be used as temporary measures, as needed, to ensure temporary structures do not damage river configuration. Movements of vehicles and machinery in river beds within the riverine habitats will always be minimized to reduce disturbance, including the prohibition of vehicles or machinery washed in the river;
 - c. If the Contractor causes damage to the river bank or other structural parts of a river, the Contractor is solely responsible for repairing the damage and/or paying compensation to the riparian owners. Furthermore, embankments and river activities will be monitored for signs of erosion during construction;

- d. Revegetation with local fast-growing species or other plants will be carried out incrementally and as quickly as possible after work within any river habitat has been completed after consultation with the landowners and suco chiefs; and
- e. Spoils, rubbish or any other surplus material will not be disposed-off within steep slopes or gorges, any river banks or floodplain areas. Suitable disposal sites will be designated in consultation with landowners and suco chiefs and approved by PMU.

c) Slope Failure and Landslides

- 356. The quarry sites as a source of materials such as gravel, aggregate etc., for the project will be agreed upon prior to the commencement of works. The Contractor will be required to identify sources and prepare a sustainable extraction plan (materials management plan) as part of the CESMP, for all sources of material and including spoils that will be used in roadworks. The aggregate extraction plan should be submitted to PMU, which will approve and monitor implementation of the extraction plan. The Contractor must obtain Mineral License for all quarry sites, as locations for quarry extraction activities will not be authorized without first securing location approval from the ANPM; subsequently completing and obtaining approval of the Site- Specific Environmental and Social Management Plan (SEMP) and Mining Plan for each location.
- 357. The use of immediately available material can be considered, as it will reduce the need for additional extraction of rock-based materials. Should there any suitable materials can reuse as far as possible on other roads or other local infrastructure projects, this will reduce the need to extract other rock and gravel resources from vulnerable hillsides and river beds. The surplus can then be stockpiled at locations agreed with local authorities for other local municipality projects or other nationally planned infrastructure. The surplus shall not be stockpiled at the side of the road or dumped over the barriers or side of slopes. Furthermore, areas for disposal shall be designated and agreed with the suco leaders and local authorities.
- 358. The CESMP submitted by the Contractor will be based on the ESMP in this SEIS and will include a section on spoil disposal to ensure waste from Project road improvement is managed properly. The CESMP will cover all aspects of construction waste disposal, and it is preferred that Government land is used for stockpiling and dumping of material. If private land will be used for the purpose of dumping, it shall commence only after written permission from the landowner is checked and recorded by the PMU and agreeable to the local authority. The surplus materials for disposal must be controlled to avoid potential impacts due to improper disposal.
- 359. The spoil disposal section of the CESMP will include; (i) locations and quantities of spoil arising; (ii) agreed locations for disposing/endorsement from DNCPIA and local groups; (iii) methods of transportation to minimize interference with normal traffic; (iv) establishment of acceptable working hours and constraints; (v) agreement on time scale and programme for disposal and chain of custody; (vi) programming issues including the time of year and available resources; (vii) the schedule of PMU inspection/monitoring; and (viii) links to the grievance redress mechanism and complaints management system for duration of the works.
- 360. The PISC will be responsible to report to PMU the monthly update of the cut and fill estimates in conjunction with asphalt and aggregate materials planning between the different areas includes to advice on overall balancing for cut and fill materials to minimize impacts on local resources.
- 361. There about 22 houses and 5 kiosks will be affected during slope cutting for widening the existing road within Section 1 and 2. In addition, around 17 houses will risk damaging due to their location at height and beneath of steep slope. Meanwhile in Section 3, there about 9 kiosks and 5 houses will be affected, and approximately 5 houses in high risk to slope failure as the location at height. This condition should be considered prior to slope cutting activities in that area.

362. In addition to the preparation of the site-specific extraction plan by the Contractor, the bid and contract documents will specifically require Contractor to (i) balance cut and fill requirements to minimize impacts from extraction of aggregates; (ii) prioritize use of existing quarry sites with suitable materials and update the list of quarries and borrow pits monthly and report to MPW/DRBFC and minimize impacts on other local resources; (iii) procure materials only from quarries and borrow sites acceptable to PMU or licensed and authorized by DNCPIA; (iv) if the Contractor shall operate the quarry site, required environmental licenses and permits shall be secured prior to operation of quarry/borrow areas; and (v) borrow/quarry sites shall not be located in productive land or forested areas.
363. The PMU assisted by the PISC will be responsible to monitor the progress of cutting slopes and the implementation of mitigation measures, to minimize impacts. The mitigation measures below also apply equally to discarded asphalt of macadam pavement surfaces. The mitigation measures in the CESMP will include but not necessarily be limited to:
 - a. Avoiding impact; decide cutting slope based on the classification of soil and rock;
 - b. Properly removed topsoil and low-quality materials and stockpile near the site to be covered and preserved for rehabilitation. A stockpile of topsoil for later usage, fence and re-contour borrow pits after use;
 - c. Construction of the catch wall and embankment at the foot of the slope. The height of the wall should be designed as the cut slope underlying the elevation of 45° from the top of the wall. The embankment structure should decide based on the factors of site and slope condition;
 - d. Use quarries with the highest ratio between extractive capacity (both in terms of quality) and loss of natural state. Use quarry sites lying close to the alignment not on slopes, with a high level of accessibility and with a low hill gradient;
 - e. Reinstate damaged access roads, agricultural land, and other properties upon completion of construction work at each section if damaged due to the transport of quarry/borrow materials, other construction materials or any other project-related activities;
 - f. Provide adequate drainage to avoid accumulation of stagnant water during quarry/borrow site operation, and avoid quarry sites lying on small rivers and streams;
 - g. Avoid use of quarry sites located on river beds. If it is not possible to locate quarries out of river beds, use only quarry sites lying on large rivers as approved by PMU. Choose alluvial terraces or alluvial deposits which lie on the river beds but not covered by water in normal hydrological conditions;
 - h. Cut berms and terraces during and after extraction in quarries in the mountainous or hilly areas to stabilize slopes, wherever slopes are important, and implement a drainage system and vegetation cover for rehabilitation;
 - i. Dewater and fence quarries and borrow pits as appropriate, upon completion of extraction activities to minimize health and safety risks. Refill borrow pits as required by DNCPIA using surplus inert material and excavated unsuitable soils;
 - j. Do not open additional extraction sites and/or borrow pits without the restoration of those areas no longer in use. Ensure borrow pits are left in a tidy state with stable side slopes and proper drainage to avoid creation of water bodies favorable for mosquito breeding;
 - k. Refilled borrow pits and cover with topsoil and plant shrubs and trees to rehabilitate as required by PMU & DNCPIA to prevent accidental access and avoid drowning when pits become water-filled by implementing measures such as fencing and providing flotation devices;
 - l. Conduct the excavation and restoration of sites and borrow areas, as well as their

immediate surroundings in an environmentally sound manner to the satisfaction of the PMU. Sign-off to this effect by PMU will be required before final acceptance and payment under the terms of the contract.

- m. Spoil will be reused as far as possible for bulk filling and will not be disposed of in rivers and streams or other natural drainage paths. In no circumstances, the spoil will not be dumped into any other watercourses (the sea, cliffs near the sea, rivers, streams, drainage, irrigation canals, etc.);
- n. Spoil disposal shall not cause sedimentation and obstruction of the flow of the sea, watercourses, damage to agricultural land and densely vegetated areas;
- o. Spoil will not be disposed of on fragile slopes, floodways, wetland, farmland, forest, mangrove, and associated salt flats, beaches, religious or other culturally sensitive areas or areas where livelihood is derived;
- p. Surplus spoil will be used where practicable for local repair works to fill eroded gullies and depression areas and degraded land in consultation with the local community;
- q. The surplus shall not be stockpiled at the side of the road near the works or dumped over the edge of the road or over the crash barriers. Spoil will be disposed-off to disused quarries and abandoned borrow pits where practicable
- r. Spoils shall only be disposed to areas approved by local authority. Spoil disposal will be monitored by PMU and recorded using a written chain of custody (trip-ticket) system to the designated disposal sites;
- s. Spoil disposal will be spread in 15 cm layers and compacted to optimum moisture content, covered with topsoil, landscaped and provided with drainage and vegetation to prevent erosion in line with best practice; and
- t. The spoil disposal site shall be located at least 50 m from surface watercourses and shall be protected from erosion by avoiding the formation of steep slopes and grassing.

d) The decrease in Water Quality and Supply

- 364. Project construction areas which adjacent to river and stream (culvert replacement, bridge repair, major bridge works), has the potential to create some temporary and minor adverse impacts on water quality including (i) increased turbidity and downstream siltation created during the removal of gravels; (ii) an increase in silt loads at culverts to be replaced and/or constructed; (ii) construction materials such as small gravel, sand, and fill, being 'washed out' into streams, rivers during rain; (iv) oil and fuel leakage and/or spills from vehicles and plant or workshop/storage locations; and, (v) discharge of waste-water and sewage from construction camp, canteen, site office and work yard to local streams and rivers.
- 365. The drainage systems and water resources on surrounding lands will be affected by construction as follows: a) surface and subsurface water resources near the proposed Project road sections could be contaminated by fuel and chemical spills, solid waste, and effluents generated by the kitchen and toilets at construction's campsites.
- 366. For the construction activities, water will be sourced from the rivers or from Dili. The measures to mitigate risks to communities and ecosystems were carried out by identifying the potential location of water sources based on the availability during dry season and competitiveness with other users in the same area, as well as the potential locations where water cannot be used either due to the availability or the sensitivity of the culture in the area. Rainwater harvesting is also a requirement for the Contractor to be used as water source.
- 367. Based on previous project's experiences, dust suppression requires approximately 1,000 litre of water per-day. Whereas, water need for batching plant operations is

approximately 200 litre for each m³ of bitumen, and such a water volume depends on the types of bitumen quality used. Water need for workers' basecamps is insignificant because the number of outside workers residing in those camps tend to be usually small in number (approximately 50 people) and water is usually sourced from the groundwater. In Hatubuilico and Ermera (sections 2 and 3), water sources were assessed to be more readily available for construction purposes in comparison with other areas in both sections without crowding out the existing community water needs.

368. The existing alignment of the branch road from Aituto up to Gleno traverses several waterways such as watercourses, streams, and some rivers. Based on observation, there are several big rivers in the Ermera Municipality, especially along Section 3 from Letefoho to Gleno that can be encountered at km 13.6 with condition is no water, and river bed full of gravel/sand; at km 14.6 the river still has few of water, with stone gravel and sand; at km 15.2 with few of water, including stone gravel and sand; and at km 18.7 (STA 37+280) few of water still found, as well as stone and sand. All the rivers almost dry up during the dry season, a limited amount of water will be available during the rainy season. Potential location of water sources as observed during the assessment include:

Section 3:

- Mota Gleno (river with 2 km distance from the road);
- Mota Railaku (river with 4-5 km distance from the road);
- Lagoa Lih-Mo (lake surrounded by Suco Eraulo, Suco Goulolo dan Suco Estado, 500 m distance from the road). Permit from Tara Bandu will be required to use the water.

Communities in Riheu, Humboe, Estado, Eraulo, Goulolo, Haupu use water springs for domestic purpose. River water is usually used for agriculture and livestock.

Section 2:

Water should be sourced either from Gleno or Aituto:

- Mota Mantanen in Aileu (river with 10 km distance from the road)
- Mota Aitutu in Dare (river with 6-7 km distance from the road).

The following water sources in Section 2 cannot be used as water sources:

- Bé matan Urbo STA 12+100 (Urbo water spring in Hatubuilico, 3 km distance from the road), lulik culturally sensitive area;
- Leana water spring and small lake STA 18+060, 10 m distance from the road, due to its low availability during dry season and use by community;
- Erasale water spring STA 16+420, 5 m distance from the road, due to its low availability during dry season and use by community.

369. Mitigation measures proposed by confining activities into dry season when there will be little or no water in the rivers and streams crossing the project road. It will be sufficient to monitor other physical mitigation measures in place at the major river crossings where bridge repairs and replacement will be undertaken as well as on stream sections close to construction camps (i.e., rivers that could receive run-off/discharge from construction/camps).
370. In addition to a number of items outlined above, the following measures will be included in the engineering design and ESMP:
- a. Lubricants will be stored in containers and placed on the sealed floor > 50 m from water bodies. Furthermore, washing of machinery and vehicles in surface waters shall be prohibited;
 - b. Work in rivers will be scheduled during the dry season and work duration shall be as short as possible. Fragile slopes shall be stabilized immediately after works are completed. Stockpile areas and storage areas for hazardous substances shall be located away from water bodies, and diversion ditches should be provided around material stockpiles;

- c. Provision of sediment traps such as silt curtain or other sediment reducing devices (rock dams or silt barriers), to prevent both siltation and silt migration during works being undertaken in the vicinity of streams and rivers;
 - d. Sediment control devices will be cleaned and dewatered; it will not discharge to the rivers or streams. Need consultation with landowners and suco chiefs to identify suitable land-based areas for settling ponds or discharge areas;
 - e. Minimizing interference with natural water flow in rivers, water courses or streams within or adjacent to work sites. Abstraction from rivers will only be allowed after permission from PMU, as pollution of water resources will not be permitted;
 - f. Solid wastes, debris, spent oil or fuel from construction plant/machinery; construction material, or vegetation waste from land clearing will not be dumped in or near streams, rivers or waterways;
 - g. Construction water containing sediment or material (including dredged spoil) will not be permitted discharge directly into the rivers, sea, inter-tidal area or surface waters. All the construction water will be discharged to the retention ponds or settling tanks with enough capacity to provide retention times prior to final discharge;
 - h. Discharge zones from culverts and drainage structures will be carefully identified, and structures will be lined with stone riprap. The chute drains will be lined with stone riprap, masonry or concrete, and include spillways to prevent undercut;
 - i. Spoil and material stockpiles will not be located within 50 m of waterways, streams or rivers, or on the edge of slopes or hills above rivers or stream and will be surrounded by perimeter diversion drains;
 - j. Contractor's site office and works yard are to be equipped with portable sanitary latrines or a septic tank that does not discharge directly to or pollute surface waters and waterways;
 - k. All water, waste-water and other liquids used or generated by project works and activities will be collected and disposed of in an approved manner and in an approved location. Such disposal will not be permitted to cause either pollution or nuisance.
371. The condition of rivers near the bridges will be reported by PMU at the end of the Detailed Design period, either in the detailed design report or in a dedicated baseline monitoring report before the bidding documents are completed.
372. The Monthly Monitoring Report will specify the time of the month when the monitoring of physical mitigation measures was undertaken. Time and date of monitoring, potential sources of contaminants/pollutants during the monitoring period shall also be included in the report. The actual location of the monitoring stations shall be described in the report and plotted on a map together with the Global Positioning System location point.

e) Solid and Liquid Waste Management

373. Waste disposal operations can cause significant impacts when uncontrolled, therefore mitigation measures will seek to reduce, recycle and reuse waste as far as practicable. The PMU will be responsible to monitor the Contractor's progress of implementing the provision of the waste management of the ESMP and all mitigation measures. The waste management section of the CESMP will also include consideration of all matters related to solid and liquid waste disposal including the following: (i) expected types of waste and quantities of waste arising; (ii) waste reduction, reuse and recycling methods to be employed; (iii) agreed reuse and recycling options and locations for disposing receive endorsement from DNCPIA and local groups; (iv) methods for treatment and disposal of all solid and liquid wastes; (v) methods of transportation to minimize interference with normal traffic; and (vi) establishment of regular disposal schedule.
374. The mitigation measures in the ESMP will include but not necessarily be limited to the measures listed below. The Contractor shall ensure the implementation of these

measures.

- a. Disposal areas to be agreed with local authorities and suco leaders; checked, recorded and monitored by the PMU (except oil waste; will be taken to Tibar disposal site);
- b. Prohibited to burn of waste associated with the Project or the supporting activities. The burning of waste will not be allowed anywhere on the Project;
- c. Waste segregations shall be observed and cleared foliage, shrubs, and grasses may be given to local farmers for fodder and fuel. Organics (biodegradables) shall be collected and disposed-off on-site by composting (burning waste not be allowed anywhere within the Project site footprint or in the camps);
- d. Recyclable wastes shall be recovered and sold to a recycler. Construction camps shall be provided with garbage bins. Residual general wastes shall be disposed of in disposal sites approved by local authorities and PMU;
- e. Strictly prohibited of soil waste disposal into flood/waterways, wetland, rivers, other watercourses, farmland, forest, places of worship or other culturally sensitive areas or areas where livelihood is derived such as canals, agricultural fields, and public areas;
- f. There will be no site-specific landfills established by the Contractor. All solid waste will be collected and removed from the construction camps and disposed in local authority designated waste disposal sites; and
- g. Waste disposal areas approved by local authorities shall be rehabilitated, monitored, cataloged, and marked.

f) Hazardous Materials and Waste Disposal

375. Hazardous substances such as oils and lubricants can cause significant impacts if uncontrolled or not disposed of properly. Mitigation measures proposed to control access and usage of hazardous substances, including control of hazardous waste disposal. The PMU will responsible to monitor the contractor's progress of implementing the hazardous materials and waste management to avoid or minimize impacts of the hazardous substance usage.
376. Hazardous materials and waste management section in CESMP will include consideration of all matters related to hazardous waste disposal as following: (i) types and volumes of hazardous materials and waste; (ii) methods for treatment and disposal of all hazardous wastes; (iii) approvals and environmental licenses required; (iv) methods of transportation to minimize interference with normal traffic; and (v) establishment of regular disposal schedule as agreed or a condition of granting of environmental license.
377. The mitigation measures identified in the ESMP include:
 - a. Ensure that fuel and hazardous substances storages are safe and agreed by PMU, as well have necessary approval from DNCPIA and local authorities;
 - b. Toxic materials and explosives (if required) will be stored in adequate protected sites consistent with national and local regulations to prevent soil and water contamination;
 - c. Maintenance of the construction's equipment/vehicle and refueling areas will be confined to areas in construction sites designed to the containment of spilled lubricants and fuels. Refuel areas shall be provided with drainage leading to an oil-water separator that will be regularly skimmed oil off and maintained to ensure efficiency;
 - d. Fuel and other hazardous substances shall be stored in areas provided with a roof, impervious flooring and secondary containment or bund wall to protect these and to readily contain spilled fuel/lubricant;
 - e. Fuel, oil, and other chemicals as required for the works will be stored in secure

- containers or tanks located away from the surface waters or streams, and in no circumstances should oil be discharged to the soil. Surplus used oil and waste chemical will be disposed of at the Tibar oil collection site and equipped with a manifest of hazardous waste;
- f. Fuel and oil spills will be contained and immediately cleaned up as per the requirement of the emergency response plan to be prepared as part of the CESMP by the Contractor, and approved by PMU;
 - g. Segregate hazardous wastes (oily wastes, used batteries, fuel drums) and ensure that storage, transport, and disposal shall not cause pollution and shall be undertaken consistent with national and local regulations;
 - h. Ensure all storage containers are in good condition with proper labeling both in English and Tetum. Prepare a regular schedule of checking containers for leakage and undertake necessary repair or replacement;
 - i. Store hazardous materials above flood level. Discharge of oil-contaminated water shall be prohibited, and separated oil shall have hazardous waste records before disposing of at Tibar disposal site;
 - j. Used oil, other residual toxic, and hazardous materials shall not be poured on the ground, these shall be disposed of in an authorized facility off-site;
 - k. Adequate precautions will be taken to prevent oil/lubricant/hydrocarbon contamination from mobile equipment of river channel beds. Washing of project vehicles in rivers and streams is strictly prohibited;
 - l. Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored;
 - m. Fuel and oil spillage will be immediately cleared with utmost caution using absorptive cleanup materials to leave no traces. Spillage waste will be disposed at disposal sites approved by DNCPIA which is Tibar disposal site;
 - n. All areas intended for storage of hazardous materials will be quarantined and provided with adequate facilities to combat emergency situations complying with all the applicable statutory requirements;
 - o. The contractors shall identify named personnel in their ESMP in-charge of storage sites for hazardous materials and ensure they are properly trained to control access to these areas and entry will be allowed only under authorization.

g) Damage to existing services, Utilities and Infrastructure

- 378. The Contractor and PMU will consult with all relevant authorities to ensure that they minimize any disruptions to the existing infrastructure and services. This includes suco water supplies, telecommunications infrastructure, and electricity supply, wherever applicable.
- 379. Plans will be obtained from utility/service providers showing all underground facilities and/or services in order to avoid damage or disruption during works. Where plans and drawings are not available, the Contractor will review by field observation and report locations to PMU in the pre-construction phase. Mitigation measures to be included in the CESMP in the pre-construction stage will require the contractor to:
 - a. Reconfirm power, water supply, telecommunications and irrigation systems likely to be interrupted by the works and any additional trees to be cut near utilities;
 - b. Contact all relevant local authorities for utilities and local village groups to plan the removal of electricity, water supply, and telecommunications (if any);
 - c. Relocate and reconnect utilities well ahead of the commencement of construction

works and coordinate with the relevant utility company at the municipality and administrative post levels for relocation and reconnection well before works commence and include for compensatory planting for trees;

- d. Inform well the affected communities in advance. Arrange reconnection of utilities and irrigation channels in the shortest practicable time before construction commences; and
- e. When utilities are accidentally damaged during construction, it shall be reported to the PMU/DRBFC and utility authority and repairs arranged immediately at the Contractor's expense.

9.5 Construction Phase: Impacts on the Biological Environment

a. Impacts on precious ecology, terrestrial habitats, flora, and fauna

- 380. Impacts on habitat, flora, and fauna as a minor impact upon terrestrial habitats of the Project area are expected as a result of the road reconstruction and rehabilitation. Habitat fragmentation occurs when a road cuts through an ecosystem. The core Project road has existed for some time and though its original construction would have caused habitat fragmentation, ecosystems have re-established albeit as altered and/or smaller units around the road.
- 381. There will be limited and minor impacts on habitat, flora or fauna. Rehabilitation work will directly cause minor degradation of local ecology through the clearance of small areas of vegetation at work sites and ancillary sites such as materials extraction sites, and material stockpiling areas. Construction activities will impact only a narrow band of vegetation within the existing road corridor.
- 382. There is no vegetation adjacent to the Project road that has any conservation significance nor is it representative of the original vegetative cover, though the road Section 2 runs at an elevation around 2,107 m above sea level; adjacent to the protected area southeastern of *Tatamailau* Mountain. Likely some gardens, plantations, and individual trees that close to the road that will require removal. They are non-endemic, common and have no special characteristics to merit protection. Therefore, in light of the nature of the project and the types of works envisaged, there will be no significant loss of valuable flora or habitat. Rehabilitation activities will take place entirely within the existing ROW or within areas already subjected to clearing in the past.
- 383. Number of affected trees in the road Section 1 is about 861 trees; that consist of 832 small trees, and only 29 large trees. Meanwhile in the road Section 2, the are ± 436 affected trees, comprise of 406 small trees and 30 large trees. Section 3, the total tree cutting is 594 trees that consist of 496 small trees and 98 large trees. The small trees is a set of the tree with a diameter of 150 – 900 mm, whereas large trees are a tree which has a diameter more than 900 mm.
- 384. Impacts on fauna. In terms of impacts on fauna, there is the potential for construction workers to poach edible animals and birds of the locality. The Contractor will be responsible for providing enough food and adequate information to workers regarding the protection of fauna and imposing sanctions on workers trapping, killing or wounding birds or other wildlife. The Contractor will also be responsible to apply land clearing procedures taking into account the prevention of adverse impacts on birds' nests and their habitats.
- 385. The PMU will supervise and monitor to check that the Contractor carries forward the mitigation measures and environmental enhancements identified in the CESMP; as well as routine matters such as avoiding unnecessary removing of trees and compensatory and enhancement planting. Invasive species shall not be introduced. During revegetation works, new alien plant species (i.e., species not currently established in the region of the project) shall not be used unless carried out with the existing regulatory framework for such an introduction. All replanting and compensatory tree planting will be planned in full agreement with the local forest authority.

386. Measures to be included in the project to ensure the protection of flora and fauna within the project area include:
- a. Contractor's site office, work yard, rock crushers, material storage, borrow pits, and quarries will all be located as approved by PMU in consultation with local authorities and will not be permitted in protected areas;
 - b. Vegetation clearance during construction activities, especially of trees along the road-side, will be avoided or minimized. In no circumstances, the Contractor or any of sub-contractors or employees permitted to enter nearby forests communities to fell or remove forest wood;
 - c. The contractor will responsible for revegetation/replanting in cleared areas. Vegetation from the clearance of roadside, during rehabilitation activities, will be stockpiled and kept for bio-engineering and mulching in the revegetation works;
 - d. The Contractor will responsible for providing adequate knowledge to construction workers in relation to existing laws and regulations regarding illegal logging. Contract documents and technical specifications will include clauses expressly prohibiting the felling of trees, not marked as requiring to be cleared by construction workers for the term of the project;
 - e. The Contractor will responsible for providing adequate knowledge to construction workers in respect of fauna. Contract documents and technical specifications will include clauses expressly prohibiting the poaching of fauna by construction workers and making the contractor responsible for imposing sanctions on any workers who are caught trapping, killing, poaching, being in possession of or having poached fauna;
 - f. The PMU will supervise and monitor a ban on the use of forest timber and workers shall be prohibited from cutting trees for firewood or collecting wood from forest areas; and
 - g. Construction workers will be informed about general environmental protection and the need to avoid unnecessary felling of trees unless justified on engineering grounds and marked for cutting as approved by PMU.

b. Accidental Encroachment into Historical/Cultural Sites

387. Consultations and research indicated that there will be six cultural sites that will be indirectly affected by the Project. Three of sites, however, has been spared from development through re-alignment of the RoW. The three sites will require the implementation of proper customary rituals prior to the commencement of work in the area. No main parts of churches will be affected from rehabilitation work, however, given the close proximity of the religious sites to the alignment, careful consideration should be given as not to disturb them during construction and to preserve access for devotees.
388. In accordance to the specific locations of gravel and material extraction site, consultation with suco chiefs as well as resource owners is also required to ensure that there are no cultural sites in the locations proposed for materials extraction.
389. Any accidental discovery of cultural sites will be handled as per the provisions set out above. In the event this occurs, work shall cease immediately, and the relevant authorities shall be informed. Activities shall not re-commence until the authorities have signed-off that the site/resources have been dealt with appropriately and that work may continue.
390. The Contractor shall responsible for complying with the requirements of authorities, and the PMU shall monitor the same. The Contractor will include a section on "chance finds" in the CESMP. Mitigation measures for potential impacts on cultural site include:
- a. No spoil materials or other waste will be stockpiled near or disposed near the cultural sites. Works will not obstruct access to cultural sites;

- b. Site agents will be instructed to keep watching for relics in excavations. Should any potential items be located, the PMU will immediately be contacted, and work will be temporarily stopped in that area;
 - c. The PMU with the assistance of the PISC will determine if that item is potentially significance and contact MPW to pass the information to the relevant department in GoTL (i.e. Secretary of State for Art and Culture) who will be invited to inspect the site and work will be stopped to allow time for inspection.
391. Work will not re-commence in this location until Government of Timor-Leste has responded to the invitation and agreement has been reached between GoTL, PMU, and MPW as to any required mitigation measures, which may include structured excavation.

9.6 Construction Phase: Impacts on Social Environment

A. Increase Noise Level

392. During construction, there will be temporary adverse impacts due to the noise of the construction equipment, especially heavy machinery, when construction activities are carried on in the vicinity of the sucos. The most sensitive receptors along the road Project include the suco residential areas, churches, health facilities, and schools.
393. Cooperation between the Contractor and the residents is essential, hence Contractor's responsibility to arrange meetings between these parties and arrange such matters as work schedules, locations of construction camps and material storage areas, include the locations of stone crusher and Asphalt Mixing Plant that > 500 m from settlements in the sucos.
394. Activities of land clearing, bulldozing, compaction equipment, excavation of existing pavement materials, and grading will produce noise. Aggregate processing is one of the noisiest activities in construction processes; however, this will be undertaken at a designated site located at least 500 m away from the nearest sensitive receivers.
395. Impacts of noise may take place in a short time, though can be very intrusive if not properly controlled. Works are not expected to be carried out at night, however, when unavoidable for unexpected reasons, additional consultations will be undertaken with the local community and appropriate working hours will be established accordingly.
396. Measures to be included in the project to mitigate the noise effects include:
- a. Community consultation will be held prior to works commence to establish acceptable working patterns in the area where local community buildings and residences are very close to the road. While work must take place at night for unexpected reasons, additional community consultations will be undertaken, and appropriate working hours agreed;
 - b. The EMP and contract document will require that all vehicle exhaust systems and noise generating equipment be acoustically insulated and maintained in good working order, and regular equipment maintenance will be undertaken to minimize noise emissions;
 - c. The Contractor will prepare a schedule of operations approved by suco chiefs and PMU. The schedule will include identification of days there should be no work, and hours of work for each construction activity and identify the types of equipment to be used;
 - d. Workers will be equipped with ear defenders as may be required. Any complaints regarding noise will be dealt with by the Contractor, firstly through the communications plan, if unresolved they shall refer through the Grievance Redress Mechanism (GRM).

B. Access and Safety Traffic

397. The Project will cause temporary negative impacts through the presence of vehicles and equipment. Inconvenience, minor disruptions to traffic on the road as well as on local access to and from the villages along the road Project during the Construction phase.
398. Mitigation measures of impacts on access and safety traffic will include:
- a. The Contractor will prepare a Traffic Management Plan, detailing diversions and management measures, and will submit to PMU for approval. Traffic signs and other appropriate safety features will be used to indicate construction works has undertaken;
 - b. A clause in the contract document stipulates that care must be taken during the construction period to ensure that disruptions to access and traffic are minimized, and all access to villages along the road Project always maintained. Provincial Works and village officials will be consulted if access to a village must be disrupted for a while and temporary access arrangements made;
 - c. Construction vehicles will use local access roads or negotiate access with landowners to obtain access to material extraction sites, rather than drive across vegetation or agricultural land. When local roads are used, they will be reinstated to their original condition after the completion of work;
 - d. The road will always be kept free of debris, spoil, and any other materials. Disposal sites and haul routes will be identified and coordinated with local officials;
 - e. Provision of adequate protection to the general public in the vicinity of the work site, including advance notice prior to the commencement of works, installing safety barriers if required by villagers, and signage or marking of the work areas; and
 - f. Provision of safe access across the work site to people whose villages and its access are temporarily affected during road sheeting activities.

C. Workers Health and Safety

399. The safeguards policy on environmental assessment requires that Health and Safety impacts on workers and the community are identified and mitigation measures will be proposed. Air pollution and noise which relevant to the health and safety aspect, include traffic safety issues have already discussed. The spread risk of communicable disease is dealt with in the next section.
400. Worker Occupational Health and Safety is generally governed by the new Labour Code of Timor-Leste and the UNTAET National Labour Code (1 May 2002). Then, as of 2009, the current National Labour Code has been in a reform process. The International Labour Organisation (ILO) has supported the drafting of the new Labour Code to include the fundamental principles of rights at work. It is expected that the Labour Code will have been approved by the Council of Ministers and Parliament before the implementation of the Project.
401. The Labour Law demands employers – in this case the Contractor's EMP – to address workers' health and safety issues by minimizing risks, providing safety equipment and establishing routine safety measures. These criteria are in line with requirement by World Bank Group's EHS Guidelines and good engineering practice.
402. Observation of general health and safety requirements, including provision of safety and protective gear and equipment to workers, will reduce the risk of accidents at the work sites. Special attention shall be given to ensure that Personnel Protection Equipment (PPE) issued by contractor responds to the needs of both men and women workers. The construction camp will be equipped with a health post which will include first-aid and basic medical Supplies, as well as condoms and sanitary napkins. To reduce the risk of incidents at the camp, access to construction camps by other than those authorized will be prohibited.

403. Female workers safety needs to be specifically considered. A major threat to women workers relates to risks of work-related sexual harassment, including sexual abuse. Sexual harassment is prohibited under the Labour Law of Timor-Leste, which provides for its definition. Considering the remoteness of the road project, the fact that workers who are not locally recruited are to be accommodated in a work camp and/or the expected higher number of male workers, there is the unequivocal need to ensure women safety is promoted.
404. Mitigation measures for reducing and avoiding impacts on worker health and safety, including women, as following:
- a. Prior to construction commences (at least a month) the Contractor shall demonstrate to the PMU that Contractor has properly resources and a qualified/experienced Environment and Safety Officer (ESO) with knowledge of gender-based violence, it will be identified by the Contractor in the bid documents;
 - b. Establishment of safety measures as required by law and good engineering practice, and provision of first aid facilities at work sites and in vehicles, include the establishment of a first aid/health post at the Construction camp;
 - c. Health post to include first aid services, access to information on family planning and condoms, as all as sanitary napkins;
 - d. The Contractor will conduct training (assisted by PMU) for all workers on safety and environmental hygiene at no cost to the employees. The Contractor will instruct workers in health and safety matters as required by law and by good engineering practice;
 - e. Instruction and induction in health and safety matters including road safety, of all workers, shall be carried out for all operatives before starting of work;
 - f. The Contractor will instruct and induct all workers in health and safety matters (health and safety induction), including construction camp rules and site agents will follow up with toolbox talks on a weekly basis, which shall include information on sexual harassment prevention and reporting;
 - g. Workforce training for all workers started on site will include safety and environmental hygiene and sexual harassment and prevention of sexual exploitation of women and children. Furthermore, the provision of potable water supply shall always be maintained in all work locations;
 - h. Workers shall be equipped with appropriate Personal Protection Equipment (PPE) such as safety boots, helmets, reflector vest, gloves, protective clothes, dust mask, goggles, and ear protection at no cost to the workers. PPE should be available in sizes that also cater to possibly smaller frames of women and to needs of persons with disabilities (reasonable accommodation);
 - i. The fence will be installed on all areas of excavation greater than 1-meter depth and sides of temporary works, as well on all excavation, borrow pits and sides of temporary bridges. Sufficient lighting needs to be installed to ensure minimum illumination for basic safety concerns;
 - j. Reversing signals (visual and audible) shall be installed on all construction vehicles and plant. Scheduling of regular (e.g. weekly toolbox talks) to orientate the workers on health and safety issues related to their activities as well as on proper use of PPE;
 - k. Protective barriers and warning signs shall be provided, when worker exposure to traffic cannot be eliminated, to shield workers from passing vehicles. Another acceptable measure is to install channeling devices (traffic cones or moveable concrete barrier) to delineate the work zone and trained flagmen at each end of the current working zone;
 - l. Construction camps shall be provided with sanitation facilities in accordance with local regulations to prevent any hazard to public health or contamination of land, surface or groundwater. These facilities shall be well maintained and cleaned regularly to

encourage use and allow effective operation and emptied regularly so as never to overflow. Facilities are to be separated by gender and with reasonable accommodation for persons with disabilities.

D. Community Health and Safety

405. Project construction could create various impacts on the health and safety of communities specially to women and those belonging to vulnerable groups. The presence of construction workers and work camps can bring about changes to the community, by increasing economic power of a limited number of individuals (mostly men) and by inducing risk on spread of communicable diseases. Sexual harassment and sexual exploitation committed by locally engaged road construction workers and technicians represent potential safety threats to women and young girls. Transmission of Sexually Transmitted Infections (STIs) and Human Immunodeficiency Virus (HIV) is a potential impact of the construction phase posed by construction workers engaging in either commercial sex or sexual relationships with local community members.
406. Potential of disease impacts due to sanitation condition will need to be controlled by maintaining hygienic conditions in the construction worker camps and implement the social and health awareness programs for the Project.
407. Public safety, particularly of pedestrian and children can be threatened by the excavation of the trenches for side drain construction. Fences will be installed within 500 m of settlements and towns prior to excavation work commencing on all sides of temporary excavations. The plans will include provisions for site security and guards, trench barriers and covers to other holes and any other safety measures as necessary.
408. The Contractor will provide warning signs at the periphery of the site warning the public not to enter. The contractor will restrict the speed of project vehicles and also control traffic by contra-flow and provide flag men, include warning signs at either end of the works where the travel lanes must be temporarily reduced.
409. The Contractors shall provide information boards near the work sites to inform and instruct the public on how to conduct themselves and to be aware of their surroundings if they must approach the works. The information contained in these boards shall be widely accessible, including through the use of local language and drawing/pictures as well as in braille. Information boards will be refreshed as necessary and also show the name and telephone contacts in PMU and contractors' offices for complaints about the works.
410. Information boards will also state that the PMU and Contractor have an open door policy as regards complaints. The Contractor will implement the following public safety measures:
 - a. The Contractor will appoint two Environmental and Safety Officer (a male and a female) to address health and safety concerns, including issues relevant for gender based violence and liaise with the PMU and sucos within the Project area;
 - b. Any barriers and signs shall be installed at construction areas to deter pedestrian access to the roadway except at designated crossing points. Warning signs will be provided at the periphery of the site warning the public not to enter and shall be widely accessible to the community, including by being written in the local language, in addition to official language, make use of pictures for those with low literacy level and in braille;
 - c. Adequate safety signs and security will be provided at the site office and works yard and prevention of unauthorized people (including children) entering work areas and camp;
 - d. The community/residents shall not be allowed in high-risk areas e.g., excavation sites and where there is mobilization or operation of heavy equipment; these sites will have a watchman at the entrance to keep the community safety;
 - e. Speed restrictions shall be imposed on project vehicles and equipment traveling within

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- 50 meters of sucos and sensitive receptors (residential, schools, places of worship, etc.);
 - f. Upon completion of construction works, borrow areas will be backfilled or temporarily fenced, awaiting backfilling. Contractors will ensure that no wastewater is discharged to local rivers, streams, lakes and irrigation channels and any other water bodies;
 - g. Provision of site security, safety barriers, and signs will be erected outside trenches deeper than 1 meter and covers will be placed over other holes. Other safety measures will be installed as necessary;
 - h. Drivers will be educated on safety drive practices to minimize accidents and to prevent the spill of spoil, hazardous substances (fuel and oil) and other construction materials during transport;
 - i. Measures to prevent mosquitoes breedings shall be implemented (e.g., provision of insecticide-treated and mosquito nets to workers), include installation of proper drainage to avoid the formation of stagnant water. Stagnant water will not be allowed to accumulate in the temporary drainage facilities or along the roadside;
 - j. Provision of safety signs and safe access across the works site, (particularly during construction of drains) to people whose village and access are temporarily affected during construction works. Construction works should avoid damage to productive trees and gardens, water resources and springs;
 - k. Provision of appropriate road safety signs along of the work site including flagman, especially at the locations of cutting slope and excavation work; to prevent any accident for worker and community who pass through the road construction area;
 - l. The Contractor and its subcontractor should aware of the community health and safety issues due to construction activities such as noise and dust or any hazardous material;
 - m. The Contractor shall ensure the construction workforce attends training on gender based violence, including sexual harassment and sexual exploitation, as well as health training on STI, HIV/AIDS prevention workshops provided through an approved service provider. The workshops will be conducted to the Contractor's workforce prior to the commencement of any civil works and shall be mandatory to every employee, whether foreign, national or locally engaged;
 - n. Provision of suco-based community awareness efforts about gender based violence, reproductive health and transmission of STIs and HIV in partnership with specialized local based organization. The program will be implemented after Contractor mobilization when training staff is in the post and prior to construction works commencing.
 - o. Construction of sidewalk and street lights on community built up or urban areas to avoid accident on the children and elderly citizens;
 - p. Construction of ramps within urban areas at intersections in front of building structures for easy and safe access of women, children and disabled.

9.7 Operation Phase: Impacts on Physical Environment

a) The increase of Air Quality

- 408. Vehicle emissions indicated by the concentration of nitrogen oxides (NO_x) will be the main air pollution sources during operation. Following the road rehabilitation and improvement, it will create air pollution such as hydrocarbons (HC), carbon monoxide (CO), nitrous compounds, sulfur dioxide (SO₂) and particulate matter.
- 409. The forecasted traffic growth is such that emissions will be low enough to not have a

noticeable effect on ambient air quality. The anticipated levels of traffic, the excess capacity of the road network, and the subsequent lack of congestion and concentration of traffic are unlikely to result in adverse impacts on air quality.

- 410. There will be a few other sources of emissions near the road Project other than from domestic fuel burning. Sensitive receivers are set far enough from the road Project to allow adequate dispersion that there will be no significant impacts at the sensitive receivers.
- 411. Particulate contamination such as dust and fumes will also be air pollution sources during operation however toxic residues from vehicle emissions near the project road are unlikely to accumulate or create significant impacts.
- 412. Dust from the existing road will be reduced due to the better asphalt surface for the new road. The conclusion in respect to air quality is that the project road is likely to continue to operate at well under its design capacity and no significant air quality impacts warranting mitigating actions are anticipated during operation and maintenance phase.

b) Adequate Water Flows

- 413. During operation phase, when there no regular maintenance on the drainage system, the constriction from debris blocking the flow in the drainage structure could result in damage to culverts and drainage structures, riverbanks or land through altered flow patterns. However, Directorate of Road, Bridge and Flood Control (DRBFC) will ensure that all culverts and drainage structures are adequately maintained so that debris does not build up causing waters to deviate around the structures stranding them and resulting in severe erosion and loss of land.
- 414. There will be a need for gravel extraction for on-going river maintenance. DRBFC will ensure that extraction will incorporate measures to protect habitats, river and river banks. The stagnant water might be formed as a result of construction, thus DRBFC should drain and back- fill these areas as part of ongoing maintenance activities.
- 415. Naturally occurring stream bank erosion could, in fact, be reduced as a result of the project if selective road sealing, gabion baskets, and rip-rap are used to stabilize the river banks and protect the road where it passes close to the rivers. There are unlikely to be any significant impacts on the soil during the operation phase of the project as long as the structures are properly maintained. Furthermore, stones riprap, gabion baskets or bio-engineering alternatives will also be used to reduce scour and erosion in identified sections.
- 416. Awareness about the need to maintain vegetative cover of areas adjacent to the road in terms of both assisting in reducing run-off that full of silt to waterways and the intertidal area and contributing to the stability of river banks and the foreshore area, can be included as a component of the project's communication plan and identified as part of the maintenance activities.

c) The decrease of Erosion and Flood Event

- 417. Scour protection and other measures to ensure normal flood behavior should be maintained. There any alterations and restrictions of natural flood cycle by temporary storage of flood waters and restricted of flood plain movements. These impacts need proper maintenance of river profile to ensure silt and debris do not cumulative collected and lead to damage to river banks and nearby land.
- 418. Soil erosion will be prevented by developing a comprehensive suite of engineering controls in the detailed designs to prevent and maintain erosion. A system will be engineered to control erosion and flooding on either side of the embankments in case of heavy rains. Apart from affecting the community lands and resources, this would otherwise cause natural streams and irrigation channels to become silted.
- 419. Measures will also be taken during the operational phase to ensure that the frequency of

maintenance is increased, and that storm drains and highway drainage systems are periodically cleared to maintain clear drainage to allow rapid dispersal of stormwater flow. An adequate system of monitoring, reporting, and maintenance will be developed.

d) The increase of Water Quality

- 420. There is a very minor risk of impacts on sedimentation and water quality through improving drainage from the road and areas landward of it in the few months when there is significant rainfall. At other times there will be virtually no runoff, but the drains will need to be kept clear of dry matter constricting the drains. Potential impacts on water quality or availability of water for domestic or agricultural use are not expected to occur. During operation, negative impacts on water quality could be caused by accidental spills.
- 421. The project will lead to longer-term environmental benefits for water quality created by the project through proper compacting of the road and surface and reducing mobilization of surface dust during rain. The dust that is resuspended and mobilized will be captured where required in sediment traps to limit the amounts finding their way to rivers.
- 422. The maintenance contractor will be responsible for the regular clearing of drainage structures to keep them effective. Additional plantings around drains will be appropriate and will help to retain surface particles on land.
- 423. Water quality may show slight improvements after rehabilitation and maintenance due to reduced erosion from improved embankments on the slopes, stabilization by retaining wall or gabion baskets, and re-vegetation to prevent erosion. However, any improvements are unlikely to be detectable in water samples due to the infrequency of rainfall.
- 424. When there is heavy rain, the replacement of damaged culverts will facilitate to the passage of high flows and reduce scouring and remove overland flows, include ensuring the integrity of the surface of the road pavement and removing a potential hazard from overflowing. The area of the impervious surface is not being significantly increased by Project, therefore increased runoff due to rehabilitation activities (if any) will be negligible in the Project area.

9.8 Operation Phase: Impacts on the Biological Environment

Improved Access

- 425. The operation of the project is not likely to induce people to the forest area to hunt timber, flora or fauna as it does not comprise the provision of additional access to previously inaccessible areas. The new road already exists and does not provide access to the interior and existing forested areas.
- 426. Deforestation is not an impact attributable to the Project because (i) single selective logging for traditional and/or cultural purposes is permitted; and (ii) logging companies purchase licenses to fell trees within prescribed areas and construct their own roads to provide access to these areas, and in any case, logging has not been a major activity in the Project area. Therefore, there will be no impacts on flora and fauna as a consequence of road rehabilitation during the operational phase.
- 427. There is no rare or endangered fauna that could be impacted by the operation of a rehabilitated road. There will be no impacts on existing or proposed conservation area as a result of road rehabilitation.

9.9 Operation Phase: Impacts on the Social Environment

A. The spread of Communicable Disease

428. Generally, roads have the potential to pose a risk as a pathway for disease transmission only if they carry a large volume of traffic, including high proportions of heavy traffic such as trucks, routes that connect cities, towns or large numbers of villages. Especially roads or highways with international borders, where improved access to major markets can facilitate international trade and there is a hospitality service industry established that is geared towards large numbers of truck drivers and mobile populations.
429. In terms of risk of transmission of communicable diseases during operation, the road Project has the potential to pose such risks although these have been assessed between low to moderate due to the number of construction workers to be deployed and hence the extent of potential interaction with local communities. As part of the ESMP and CESMP, such risks are expected to be mitigated by the implementation of the Project's STIs/HIV/AIDS awareness and prevention campaign and GBV prevention measures.

9.10 Indirect and Induced Impacts

429. Potential Traffic Increase: the current baseline information shows that along Hatubuilico to Letefoho Section, the traffic is comparably lower than the third section. Motorcycle has the largest share in the overall traffic volume, making up to 78% of the total. Light truck is the second dominant mode of public transport accounting for about 15% of the traffic volume. Light trucks are used for transporting passengers and hauling goods/cargoes. This indicates that these light trucks also serve as public transport for this section. About 80% of the Light Trucks carry full passenger load, of approximately 20 people per Light Truck. No private car was counted in this section of the study area as the poor road can only accommodate jeep/4WD, pick-up and light trucks to carry group of people and goods on the Hatubuilico-Letefoho section.
430. The branch road rehabilitation is expected to increase the traffic and may induce speeding behavior amongst local users. The TLBR Feasibility Study outlines that the increase could reach about 25% of the normal traffic (2018) due to the improvement of the road based on traffic growth rates. The mitigation measures are interrelated to road safety measures that have been described in the ESMP.
431. In areas where there may be significant congregation of people, such as markets, churches, schools or settlements, measures to slow down traffic, such as road bumps and traffic signs will be installed. In the event of road damages, necessary measures to minimize safety risks will be established by the PMU. These include installation of road signs, mobilization of traffic officers, and street lights.
432. Potential Tourism Increase: the road influence area (RIA) of branch roads has a development potential for tourism and agriculture. In terms of tourism, once the road is improved more tourists may be attracted to go to Mount Ramelau, also known as Tatamailau which the highest mountain in Timor-Leste due to improved access. Mt. Ramelau can be reached from the town of Hatubuilico, which is 3 km to the northeast or from the village of Aimeta 6 km to the north; both requiring 910 m (2,990 ft) of climbings. Aimeta can be reached from Letefoho in about 1½ hours. The Tatamailau is dedicated to the Virgin Mary and the subject of an annual pilgrimage commemorating the Annunciation of the Blessed Virgin Mary, on or around 25 March. There is a 3 m high statue of the Virgin Mary on the peak, which was brought from Italy and was erected during the Indonesian occupation in 1997. Visitors usually camp below the mountain summit and experience the sunset and sunrise from the same location. On the western side of Mt. Ramelau, the scenery of Letefoho with combination of Portuguese architecture and traditional houses becomes another tourist attraction.

433. Additional attractions in RIA are the lush coffee trees and tropical fruit vegetables grown around the main towns of Gleno and Ermera. In addition, local markets also attract tourists who come from the outside. Ermera is also another point of tourist visits, since it hosts numerous buildings with Portuguese architecture.
434. Based on the Timor Leste Tourism Research and Development Report, June 2014, the existing tourism attractions and occasional activities in Mount Ramelau tend to be small scale and intermittent. Existing infrastructure is generally dilapidated and run down. Most key tourism locations are currently severely hampered in their development due to bad roads and availability of public transport. At this stage in Timor-Leste, there does not appear to be strong international potential for larger scale 'fly and flop' stay-put resort tourism (despite this being an extremely massive sector internationally). This is due to the current relatively high cost of holidaying in Timor-Leste (both air access and land costs) and challenges in terms of travel time required compared to competing neighboring destinations - exception from Northern Territory (i.e. the 'fly and flop' sector tends to be time poor (short stays) and price focused). Other reasons for this observation include Timor-Leste's physical constraints as most of the more attractive beaches are relatively small and narrow with limited fresh water availability and the lack of compelling associated quality attractions in Timor-Leste for this sector even if large scale resorts were built (e.g. entertainment, shopping, etc).
435. At a domestic level there is potential to increase the number of people visiting the districts for holiday. That said, much such visitation will continue to be mostly weekend/public holiday concentrated. Expats working in Timor-Leste have the most potential in terms of booking commercial accommodation in district locations, as Timorese tend to stay with family when travelling and do not usually engage in commercial recreational activities. Those Timorese who can afford and want to holiday in commercial accommodation are much more likely to go to places like Bali. With a recent decline in the number of expatriates residing in Timor Leste, the growth potential for local tourism may be challenged.
436. The provision of good roads and infrastructure may support growth of local tourism and economic growth to a limited scale. The increasing number of tourists will likely be from domestic and independent travelers or small group tours with the opportunity to experience culture and for select tourists who have tolerance to non-international standard facilities/service.
437. Potential Settlement Increase and Increased Market Accessibility and Mobility: the main livelihood of community in this mountainous area is mostly centered around vegetable farming such as lettuce, cabbage, carrot, and potato. Meanwhile, communities in the several areas in Letefoho rely on coffee growing as their livelihood as well as cattle raising. Grassing areas are therefore important part of community livelihoods. Establishment of settlements along the road corridors is dependent on water availability. Water sources mainly come from local springs, located on hill tops. Water is then distributed through water tank and pipelines to the settlement areas in each village.
438. The road improvement will further support access of coffee farmers and traders to the main market in Dili. Hence, improve road access is expected to promote travel efficiency and agricultural productivity. In the long term, the local economy along the road corridor and employment can grow
439. The temperature in the protected area in Section 2 Hatubuilico-Letefoho with the altitude around 2,000 meter is low (10⁰-15⁰C). This low temperature and the lack of water resources in the area account for detrimental conditions for the development of new settlements. Hence, expansion of new settlements is not envisaged due to the proposed road upgrades.
440. Potential Disturbance to Protected Areas: The Project area is adjacent to cultural heritage on a few sites in villages, as well within a protected area. The project consists of road rehabilitation which partly (± 12 Km) passes through a protected area and important biodiversity-birds area. The type of vegetation that forms the secondary forest in the

protected area is homogenous, i.e. *Eucalyptus urophylla*. Indirect impacts to the habitat and vegetation adjacent to road works areas may include noise and deposition of dust generated by increased traffic/construction activities, improper dumping of construction/solid wastes. Mitigation activities for proper land clearing, noise and dust reduction and waste management are expected to minimize these potential impacts. The avifauna survey and the provisions to observe and examine the presence of birds' nests prior to trees removal in the land clearing procedures are among the precautionary measures in ESMP to prevent the adverse impacts on the bird habitat.

441. The Government of Timor Leste's Department of Protected Areas and National Parks (PNAP or Plano Estratégico Nacional de Áreas Protegidas) has the role to monitor the protected area in Section 2 by disseminating information on protected areas to the communities and stakeholders and monitor the construction work in protected area, while the Ministry of Agriculture, Forestry and Fisheries contributes to monitor provision of bio-engineering vegetations.

B. Any other impacts

442. Other unanticipated impacts that were not identified during the SEIS/ESIA consultations are well anticipated. Reflecting from the experience of other previous and on-going road projects, the need for adaptive safeguards management becomes instrumental. The existing capacities within the PMU will need to be ramped up through the following measures: a) additional personnel dedicated to safeguards management and community engagement, b) more robust monitoring/oversight from both the PMU and supervision engineering, c) strengthening the GRM systems and their accessibility, including tailoring specific mechanisms to address specific issues, such as GBV, d) introducing a social audit process to understand stakeholders' perceptions of impacts as well as benefits and/or opportunities that the project generates.

9.11 Impact Assessment of the On-going Construction Project under the GoTL's Emergency Road Project

443. Background: at the preparation stage of the Branch Road Project, the GoTL commissioned an "Emergency Roads" initiatives in select segments of the Section 3. This construction has been undertaken by the DRBFC of the MoPW to address road damages and blockages due to land slides. Construction activities cover road widening, basic reparation of the existing road infrastructure, which includes installation of road-side drainage and retaining walls in some critical/landslide prone segments.
444. This Emergency Road Project started in 2017, initially with repairing of road surfaces. However, since June 2018, the civil works have expanded and involved slopes-cutting and back-filling and road widening.
445. Subsequent environmental and social impacts were reported, including community grievances due to improper management of soil disposal and slope cutting with observable impacts on community coffee plantations. Furthermore, improper land clearing and construction have also increased the risks of landslides, community health and road safety due to dust production, as well as increased run-offs with adverse impacts on spring water and ground sources. Operations of heavy vehicles and haul trucks along settlement areas have been attributed to minor damages in community infrastructure and properties (i.e. cracks). Some of the owners of affected trees (i.e. coffee) have not been compensated for their lossess. Furthermore, some impacts on private land as a result of the widening were reported but not documented.
446. Following a joint PMU-World Bank Mission in October 2018, a Tracer Study for Section 3 was recommended. Following this mission, a tracer study was undertaken in November 2018 to document impacts that have been caused by the on-going GoTL's emergency project. Once updated, this tracer will establish a baseline of impacts which will be re-validated. Remedial measures, including top-up compensations and management of

existing environmental and social impacts will be incorporated in the CESMP.

447. As of October 2018, Section 3 (Letefoho-Gleno) has been widened and repaired under the GoTL's Emergency Road from STA 37+450 to STA 40+900 (3.45 km) and from STA 46+100 to STA 51+000 (4.90 km). Current observation indicates that road widening covered up to 6 meters, with a 1 to 1.5- meter shoulder on each side. The widths tend to be larger on road curves. This road widening has affected Suco Goulolo and two aldeia (Baturema and Kailiti) affected by the Road widening from STA 37+450 to STA 40+900 (3.45 km). Another segment from STA 46+100 to STA 51+000 (4.90 km) affected three Socos (Eraulo, Estado, and Humboe). A corrective action plan has been included as part of the ESMP and LARAP and is intended to aid the GoTL to address existing impacts caused by the Emergency Road Project in Section 3.
448. Some of the segments in Section 3 which were included under this on-going road project cover STA 37+450 to STA 40+900 (3.45 km length) and from STA 46+100 to STA 51+000 (4.90 km length). Additional segment with the length of 5.6 km (from STA31+900 to STA37+500) has been completed at the time of the TLBR project preparation. The tracer study is currently being updated to document environmental and social impacts, including lost assets and land. The total length of the Section 3 affected by the Emergency Road is approximately 8.35 km. This first phase of the tracer report covered impacts on the first two segments i.e. STA 37+450 to STA 40+900 (3.45 km) and from STA 46+100 to STA 51+000 (4.90 km).
449. Any additional works by the GoTL under the emergency road project in Section 3 will need to comply with the World Bank's safeguards policies. Management of potential environmental and social impacts, particularly pertaining to land acquisition must be carried out in conjunction with the TLBR's Environmental and Social Management Plan (ESMP) and Land Acquisition and Resettlement Action Plan (LARAP). Further analysis is provided in the Tracer Assessment in the LARAP (Annex 6).
450. Impact Assessment: a Detail Engineering Design of the Section 3 was not available at the time of the tracer assessment. A request of the DED for the on-going project was made to the civil work contractor. However, no written and official information was received.
451. Transect walks on a sampling basis and graphic and spatial analysis of Section 3 were made to compare the road conditions before and after the construction intercepted by the Emergency Roads before and after the construction. This was confirmed with interviews with Suco/Aldeia and affected people. This information combined was used to set the boundary of the Tracer Study as well as the on-going project's corridor of impacts.
452. The total length of the Section 3 affected by the Emergency Roads (STA 37+450 to STA 40+900 and STA 46+100 to STA 51+000) is 8.35 km. The current conditions of the Emergency Roads segments varied in Goulolo and Eraulo. Most of civil works covering road widening, installation of retaining walls and drainages have been completed. In Estado, some minor civil works for improving drainages were observed. More extensive construction activities covering road widening, slope cutting and backfills, land compacting, installation of retaining walls and drainages are currently ongoing at the time of the assessment. In addition to immediate land taking for road widening, impacts on private properties were also reported to be associated with soil compacting and soil disposal. Some of the newly compacted and flattened land parcels have been occupied for temporary kiosks and semi-permanent houses, which present community hazards due to landslide risks.
453. Impact on Private Land and Structure: the construction activities under the GoTL's emergency road operations in the Section 3 affected 49 land owners who reside in Humboe, Goulolo and Haupu Socos. The scale of impacts varies. While some impacts are minor to the overall land holdings, some households experienced more severe impacts than the rest, as detailed in Table 1. Hence, further livelihoods restoration support will be needed to address impacts on these households.

454. On the basis of the initial survey, the total claims of land affected cover 22,954 square meters (STA 37+450 to STA 40+900 (3.45 km) and STA 46+100 to STA 51+000 (4.90 km). Such impacts were mostly attributed to slope cutting as well as improper soil disposal on productive agricultural land.
455. All identified 24 affected land parcels in Goulolo Suco and Haopu Suco are equipped with land ownership certificates issued by the Indonesia's Land Agency (BPN), which is also recognized under the current GoTL's law. These affected private land parcels were either expropriated or impacted without adequate compensation and required improvements such as retaining walls and/or land compaction to prevent and/or minimize risks associated with landslides as well as damage on private structure i.e. cracks. Such impacts have been documented in the Branch Road Project's (BRP) ESMP.
456. In Sucos where the status of land ownership could not be verified, such as in Suco Humboe, claimants were not previously consulted and hence adequately compensated. The tracer study indicates that there were some arguments on the establishment of a new boundary for the ROWs which were recognized as the government's land and therefore, further consultations to settle land claims will need to be conducted prior to the BRP's implementation. No claims on private structures impacted by the GoTL's emergency road project were reported.
457. Impacts on Productive Trees / Crops: the Tracer indicates that there is no private structure directly affected or claimed. However, impacts on agricultural land, which subsequently affected productive crops and trees, including coffee, bamboo, banana, aikakeu, jack fruit, mango, avocado, and some different varieties of timber woods like aiteka, ai-na and gemilina were reported. Since Ermera is known as a coffee growing area, there are 41 land owners whose coffee plantations have been affected by improper soil disposal as a result of the GoTL's emergency road construction activities. Out of the 41 coffee farmers identified, 9 experienced more severe impacts than the others due to the number of trees impacted. Further assessments with regards to livelihoods impacts as a result of the GoTL's emergency project will need to be completed as part of the tracer updating process.
458. About 40 percent of the coffee trees affected have been compensated at a value of \$ 5.00 per tree. The remaining 60 percent of the coffee trees have not been or have been partially compensated. The contractors were reported to have promised to compensate landowners, which would warrant monitoring by the GoTL.
459. Lack of Consultation and Disclosure, Underpaid Compensation Value and Improper Damage Assessment by Local Contractors: All affected land owners as well as Suco/Aldeia chiefs informed there was no public consultation conducted to inform about the Emergency Road construction activities in the area. Disclosure was only done through sign boards in front of the contractors' office indicating the project duration, total budget, contractor name and budget amount and source. The tracer study also indicated that partial information was disseminated and access to information about project activities relied on project supervisors and contractors who interacted directly with affected communities.
460. Compensation payments were made directly to complainers following agreements on damage assessment results and valuation of affected trees/crops. Only agricultural land parcels with productive crops and productive plants (i.e. coffee, banana, jack fruit, orange etc) were compensated. Timber trees which serve as shades for the coffee plantation, such as albasia and acacia. Except for these shade trees, the contractor used the same price standard for each tree, which is USD 5 per stem of trees. Payments were made in cash in two tranches (usually within 2 months).
461. Corrective Action Plan: the following corrective measures have been consulted with relevant stakeholders, including affected communities in Section 3. Relevant provisions have been incorporated in the ESMP:

- a. **Top-up compensation and livelihoods restoration assistance:** GoTL has issued a standard price to value trees/crops affected by government projects. The standard price was issued in 2014 by State Ministry of Agriculture. On the basis of this standard pricelist, underpaid compensation values for trees /crops affected shall be re-assessed to determine the differences. Top up compensation values shall be made to cover the gap. Unpaid tress/crops shall be fully paid using the prevailing Standard Price for Trees/Crops applicable at the time of tree/crop cutting. Eight (9) affected people/households were assessed to be severely affected due to significant loss of incomes as indicated in Table 1 and hence, shall be entitled to livelihood restoration support. Available packages for such support will be further discussed in consultations with these affected people/households.

Twenty-four (24) affected land owners with recognized land certificates (issued by Indonesia's Land Agency) are entitled for full compensation of their private land parcels affected/expropriated by the GoTL's Emergency Road Project. Similar to section 2, a negotiated settlement approach will be adopted and a standard compensation value for private land parcels will be issued by GoTL as a benchmark for negotiation. The same standard for compensation package and/ or agreed mitigation measures for the remaining of twenty-five (25) affected land owners whose certificates of ownership will apply following due processes to verify and validate land ownership.

- b. **Addressing grievances and strengthening consultations and community engagement:** For the upcoming additional construction activities under the GoTL's Emergency Roads (from STA 31+900 to STA 37+500) or 5.9 km length, a standardized FGRM as well as consultation requirements under the Branch Road Project shall be applied to avoid and minimize potential adverse impacts.
- c. **Spoil disposal and slope management:** As part of the remedial measures of the on-going impacts, such as unstable slopes, areas prone to erosion, improper spoil disposal (particularly on agricultural land) and improper drainage, the design of Section 3 must incorporate necessary measures to improve the quality of the road construction through the on-going project and minimize existing impacts on local communities (i.e. rehabilitation of agricultural land, installation of retaining walls, and revegetation).

9.12 Need for Grievance Redress Mechanism

462. The Minister of Public Work with assistance from the PMU will establish a Grievance Redress Mechanism (GRM) for the Branch Road to address grievances about the project's environmental and social performance and facilitate resolution of complaints by affected people. The GRM will be facilitated by the PMU and be applicable to all contractors who will be required to maintain a grievance registry or record. The PMU will designate two officers (a male and a female) to liaise with the Suco leaders and GRM committees at the municipal level.
463. The community will be made aware of the relevant contact numbers and contact persons in PMU and each contractor through village and notice boards at the construction sites, and local authority offices. The contractors and the PMU are required to enforce an open door policy whereby project affected communities will be informed about relevant contacts and ensure confidentiality of the complainants at their request. The GRM will address affected people's concerns and complaints promptly, using an understandable and transparent process based on traditional methods for resolving conflicts and complaints. The GRM will provide a framework for resolving complaints at the project level as well as beyond the Project (involving relevant government offices such as Municipal and Suco Committees, DNCPIA, etc.), using the existing judicial or administrative remedies. GBV and land acquisition related grievances will be further

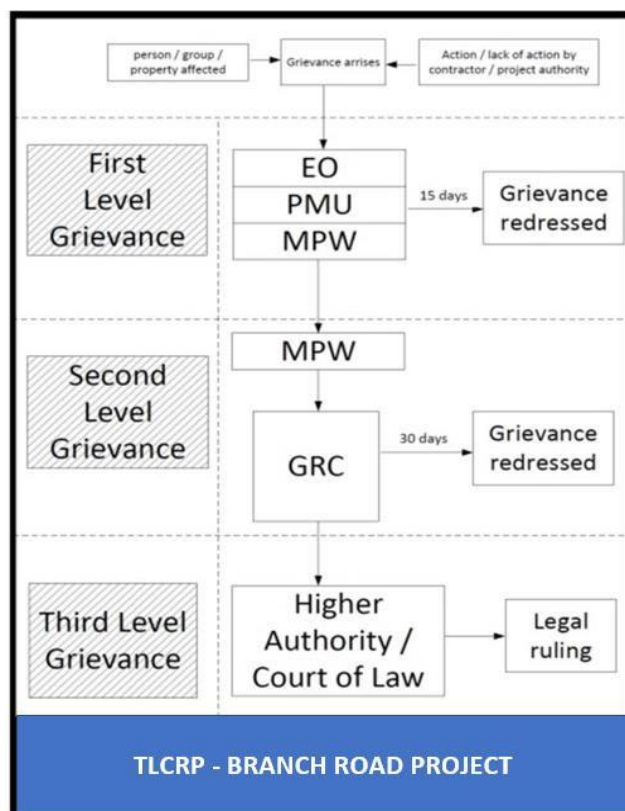
detailed in the ESMP and RAP respectively.

464. 4 traditional methods for resolving conflicts and complaints, if needed. When dealing with specific complaints against a worker which constitutes gender-based violence, the GRM procedure shall ensure sharing of information on support service providers, confidentiality of the information and start a disciplinary procedure against the relevant worker. Traditional conflict resolution methods are not to be used for GBV. A specific Grievance Redress Mechanism (GRM) will be designed specifically for reporting GBV and SEA incidents and to respect confidentiality in coordination with local leading partners.
465. The GRM has been designed to receive, evaluate and facilitate the resolution of affected people's concerns, complaints and grievances about the environmental and social performance at the level of the project. The PMU will maintain an open-door policy to accept complaints at all levels concerning the environmental performance of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the Project.
466. A Project Information Booklet will include information on the GRM and shall be widely disseminated throughout the project corridor by the safeguard officers in the PMU. Grievances can be made verbally at the Construction site to the liaison officers. Grievances can be also filed in writing or by phone by any member of the PMU, construction sites and other key public offices, all of which will accept complaints.
467. Building on the existing GRM for the Timor-Leste Road Climate Resilience Project, alternative arrangements for redressing of grievances through a cascaded approach starting from the village/suco level committees up to the municipal government and PMU will also be retained and strengthened. This GRM route is envisaged to address not only administrative issues, such as compensation payments and wages, but also other construction-related grievances that may not be documented or reported to the contractor and/or PISC. However, this route shall not be used in cases of GBV

9.13 GRM Steps and Procedures

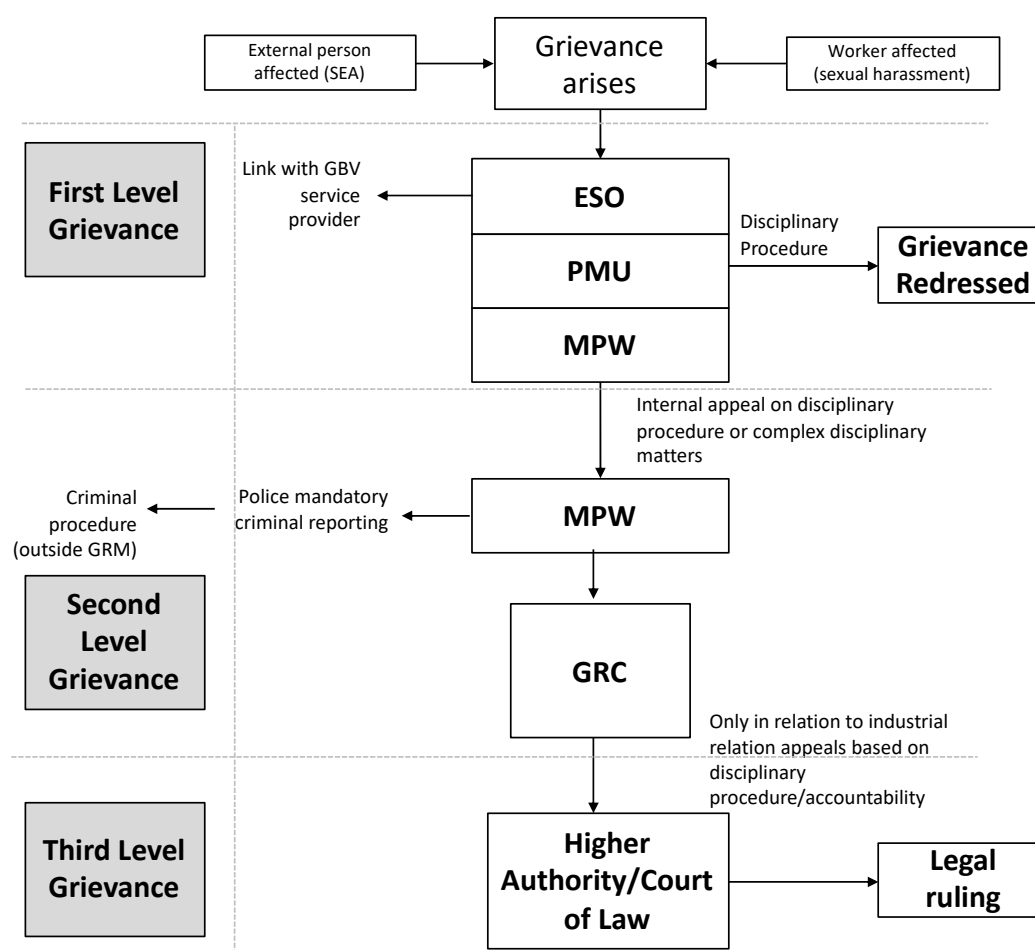
468. First Level. The Contractor and/or PMU are the first level of GRM which offers the fastest and most accessible mechanism for the resolution of grievances. One of the two safeguards officers or designated officer in the PMU shall be the key officers for grievance redress. Resolution of complaints will be done within fifteen (15) working days and will include disciplinary actions in relation to workers behaviour in violation with the Code of Conduct. The safeguards officers in PMU will provide the support and guidance in grievance redress matters. Investigation of grievances will involve site visits and consultations with relevant parties (e.g., affected persons, contractors, traffic police, etc.). When the grievance relates to a specific worker behaviour, investigation shall be undertaken within the disciplinary procedure. Grievances will be documented and personal details (name, address, date of the complaint, etc.) will be included unless anonymity is requested. Confidentiality of the disciplinary procedure will be secured, including confidentiality in relation to gender-based violence.
469. A tracking number shall be assigned for each grievance, and it will be recorded including the following elements: (i) initial grievance record (including the description of the grievance), with an acknowledgement of receipt handed back to the complainant when the complaint is registered; (ii) grievance monitoring sheet, describing actions taken (launching a disciplinary procedure, investigation, corrective measures); and (iii) closure sheet, one copy of which will be handed to the complainant and the respondent once the procedure is concluded after he/she has agreed to the resolution and signed-off. The updated register of grievances and complaints which do not relate with behaviour of individual worker, will be available to the public at the PMU office, construction sites, and other key public offices along the project corridor (offices of the suco and municipalities). Should the grievance remain unresolved it will be escalated to the second level.

Figure 9.4: Grievance Redress Mechanism



470. **Second Level.** At the second level GRM specific procedure will take place dependant on the nature of the grievance. The PMU will activate the second level of GRM by referring to the unresolved issue (with written documentation) to the PMU who will pass unresolved complaints upward to the Grievance Redress Committee (GRC). The GRC shall be established by MPW before the commencement of site works. The GRC will consist of the following persons: (i) Project Director; (ii) representative of Municipality and Suco; (iii) representative of the affected person(s); (iv) representative of the local land office; and (v) representative of the National Directorate of Environment (DNCPIA) (for environmental-related grievances). As it relates to grievances caused by worker in violation of the Code of Conduct, the second level will be activated when an appeal is made related to the conclusion of the disciplinary action taken at the first level or when the complexity of the disciplinary procedure meant that the procedure could not be concluded at the first level.
471. A hearing will be called with the GRC, if necessary, where the affected person can present his/her concern. The process will facilitate resolution through mediation. The Grievance Redress Mechanism and procedure is depicted in Figure 9.4.

Figure 9.5 - Grievance Redress Mechanism for Gender-Based Violence Cases



472. The Grievance Redress Committee will meet as necessary when there are grievances that cannot be solved at the first level and within thirty (30) working days will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision and a timeframe that must be adhered to. The functions of the GRC are as follows: (i) resolve problems and provide support to affected persons arising from various environmental issues and including dust, noise, utilities, power and water supply, waste and soil disposal, landslides, traffic interference and public safety as well as social issues

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- land acquisition (temporary or permanent); asset acquisition; and eligibility for entitlements, compensation and assistance; (ii) resolve appeals against decisions on disciplinary measures against a worker or unsatisfactory disciplinary outcome from the complaint perspective; (iii) reconfirm grievances of displaced persons, categorize and prioritize them and aim to provide solutions within a month; and (iii) report to the aggrieved parties about developments regarding their grievances and decisions of the GRC.
473. The PMU will responsible for processing and placing all papers before the GRC, maintaining a database of complaints, recording decisions, issuing minutes of the meetings and monitoring to see that formal orders are issued, and the decisions are carried out. The Contractor will have observer status on the committee. If unsatisfied with the decision, the existence of the GRC shall not impede the complainant's access to the GoTL's judicial or administrative remedies.
474. Third Level. In the event that a grievance cannot be resolved directly by the Contractor or PMU officers (first level) or GRC (second level), the project affected person can seek alternative redress through the Suco or Municipal Committees under the existing arrangements for redress of grievances for affected persons. The PMU or GRC will be kept informed by the district, municipal or national authority.
475. Monitoring reports shall include information about the GRM including: (i) the cases registered, level of jurisdiction (first, second and third levels), number of disciplinary procedures, decisions made, and the status of pending cases; and (ii) an appendix which lists cases in process and already decided upon may be prepared with details such as name, ID with unique case serial number, date of notice/registration of grievance, date of hearing, decisions, remarks, actions taken to resolve issues, and status of grievance (i.e., open, closed, pending) and if it is a repeat of a previous grievance.
476. In relation to GBV complaints the name included in the appendix refers to the worker name and not that of the complainant or the survivor and the GRM shall look at it within a labour disciplinary measure. A specific reporting protocol will be established for the project to help maintain confidentiality of GBV survivors and ensure timely referral of survivors to adequate services.

10. Environmental and Social Management Plan

10.1 Environmental Management Plan Overview

477. The Environmental and Social Management Plan (ESMP) contains a number of components crucial to effective environmental management within the Project. These include: (i) organizational responsibilities (for various aspects of ESMP implementation); (ii) consultation and information disclosure; (iii) plan for mitigation of impacts (during pre-construction, construction and operation); and (iv) monitoring. These are explained in detail in the sub-sections below. Anticipated environmental impacts and recommended mitigation measures during the pre- construction, construction and operation phase are discussed and summarized in Table 10.1.

478. Meanwhile basis of the plan, location, timeframe, basis of mitigation and monitoring, the source of funds, and the concerned parties for its implementation and supervision are included in the tabulation of Table 10.4. The same will also be attached in the Bidding Documents and Contractor's Contract to ensure its application.

Table 10.1. Environmental Management Plan Summary

IMPACTS MITIGATION	IDENTIFIED LOCATION	APPLIED MITIGATION	SOURCE OF FUND
Soil erosion (during construction)	Slopes affected by the construction	Considered in the design	Included in the Project Contract Cost
Surface water contamination and drainage pattern (during construction)	Waterways traversed by the road	Considered in the ESIA/ESMP, Mitigation will be applied	Included in PISC for civil works
Bio-Engineering (erosion control blanket)	Sites for bio-engineering	Mitigated by Bio-Engineering Expert	Included in the Project Contract Cost
Noise and Vibration	Sensitive areas	Considered in the ESIA/ESMP, Mitigation will be applied	Air quality control cost provided by the PISC for civil works
Human health, safety, and hygiene	Office, campsite, laboratory, stockyard, AMP, stone crusher, etc	Considered in the general requirements of technical specification for civil works.	Included item of the contractor's works
Flora and Fauna	Sites for clearing	Considered in ESIA study	Included in the PISC for detailed engineering
Dust suppression	Sensitive areas	Considered in the ESMP mitigation measures	Part of construction cost, the contractor prepares construction methodology

10.2 Institutional Arrangements and Responsibilities

479. The institutional arrangements and responsibility are further elaborated in one of the sub-sections of ESMP that presents a discussion of the environmental management structure and activities that will be undertaken as part of overall Project implementation. The roles and responsibilities of various agencies in undertaking these activities are then defined. The institutional strengthening activities that will be required to allow those organizations to fulfill their nominated roles and responsibilities are identified. An environmental monitoring program has been prepared and the cost associated with its implementation has been identified.

A. Overall Monitoring Responsibilities

480. The PMU will responsible for monitoring of the Project construction activities; assisted by the PISC environmental specialists on day to day basis. PISC will carry out regular daily and weekly inspections of construction activities and monitoring of mitigation measures. PMU will carry out spot checks to complement the activities of PISC, and this will provide efficient use of the environmental monitoring resources available to the Project.

B. Organization Roles and Responsibilities

481. The overall organizational structure for environmental management for the Project is shown in Figure 10.1.

C. Role of the Ministry of Public Works

482. Ministry of Public Work, as implementing agency (IA) for the Project has overall responsibility for preparing, implementing and financing of environmental management and monitoring tasks as they pertain to the project and interagency coordination. MPW will exercise its functions through the PMU which will be responsible for general project execution, and which will be tasked with day-to-day project management activities, as well as monitoring.
483. A consulting firm has been hired to provide services for detailed engineering design and other assignments, as needed.
484. **Project Management Unit.** The PMU is already established in MPW to implement the project and manage detailed design and supervision of construction. The PMU is headed by a full-time Project Manager and supported by a team consisting of staff and consultants engaged under different project arrangements.
485. The PMU will be responsible for the following: (i) assisting the IA in implementing the Project; (ii) carrying out procurement and engaging design and supervision consultants (PISC) and contractors; (iii) as required liaising and coordinating with the DRBFC; and (iv) managing the contractors, and liaising with other stakeholders, on the day to day implementation of Project activities. The PMU, through the PISC, will retain experienced consultants to monitor and report on Contractor compliance with the approved CESMP.
486. PMU needs to recruit safeguards staff who can receive training and capacity building under various projects financed by development partners. PMU has established an Environmental and Social Team (EST) that consist of national environment specialist (NES) and national social safeguards (NSS) – who will receive capacity building and training from international environment specialist (IES) and international social safeguards (ISS).
487. In the implementation of environmental management and monitoring tasks, specific technical assistance will be provided by environmental specialists that are part of the PMU. The specialists will assist in all aspects of the implementation of environmental assessment and management, internal Monitoring and Evaluation (M & E), and training of MPW and MECM and other relevant government agencies.
488. PMU will prepare Quarterly Progress Reports and submit to MPW and WB, these will incorporate the main items raised in contractor's monthly reports and the environmental monitoring reports prepared by PMU environmental specialists and NES, as well as all other items required by MPW and the World Bank.
489. **Project Implementation and Supervision Consultant (PISC).** The PMU will be supported by PISC. The PISC will comprise international specialists as required to supplement existing PMU resources and deliver a capacity building program. In respect of safeguards, the PISC will include an international environment consultant (IEC) and international resettlement and social development specialist. National environment consultant (NEC) will also be required full time to monitor the contractor's mitigation measures on a daily basis. The first inputs of each international specialist will be 2 months to maximize capacity building efforts across a number of activities required in the first phases of implementation as well as for more general awareness raising and training needs. The NEC should be in place by the time when the Contractor is mobilized.
490. Capacity building program in environmental assessment and management will be delivered by the IEC and NEC. Related staff in the MPW, PMU, NEC, and contractors will receive training and capacity support from the IEC to ensure learning and development, as well as smooth and effective implementation of the Construction ESMP.

D. Role of National Directorate of Pollution Control and Environmental Impact

491. The National Directorate of Pollution Control and Environmental Impact (DNCPIA). The agency responsible for environmental management was consulted at the onset of the SEIS process and will be consulted on the confirmation of the categorization of the Project.
492. Under the provisions of the Environmental License Law, the IEE will be reformatted into the SEIS and submitted to DNCPIA for review and issuance of environmental clearance. Ongoing consultations with DNCPIA will be required during the construction of the Project and DNCPIA will be asked to assist in the monitoring of the implementation of the Construction ESMP and ensure that environmental management and mitigation of the Project is undertaken to an acceptable standard. Periodic inspections will take place with the DNCPIA, Project Management Unit, PISC, and Contractors.

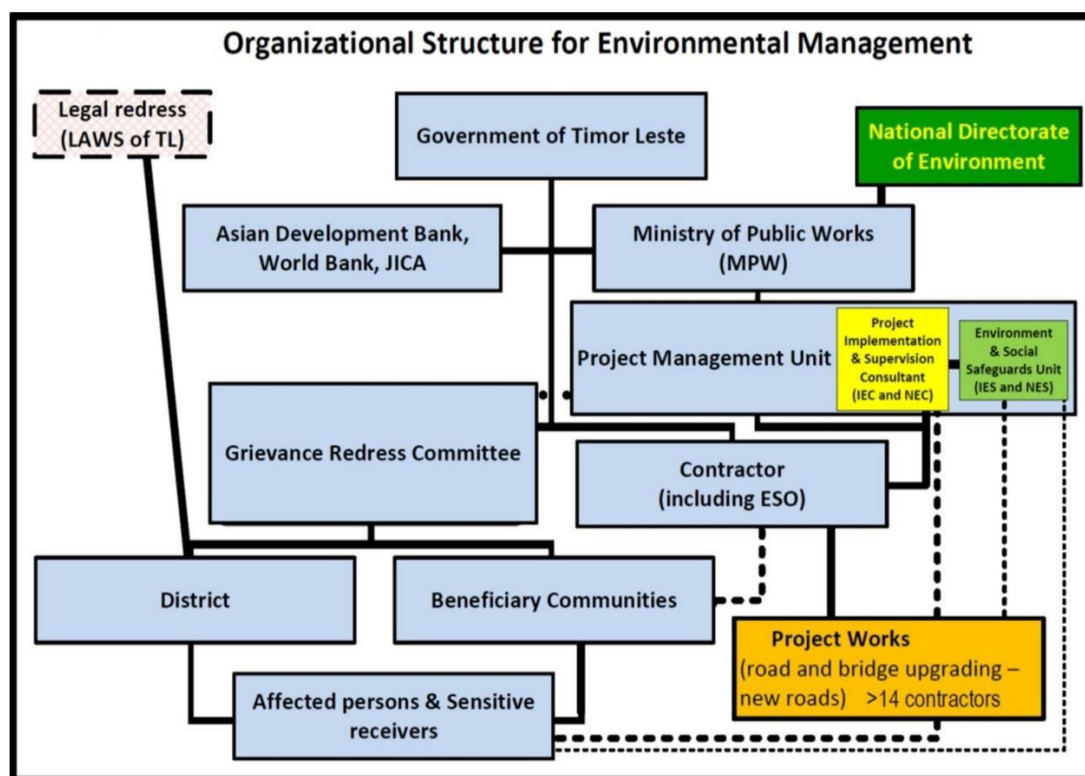
E. Role of the Contractor

493. The Contractor will be responsible for responding fully to all contract conditions including those covering environmental mitigation, social mobilization and awareness, and monitoring. The Contractor will then be responsible for implementing all environmental, occupational health and safety actions included in the Environmental and Social Management Plan (ESMP) and relevant clauses in the bidding documents and contract during the pre-construction and construction phase.
494. The Contractor will prepare a CESMP based on the site-specific construction methodologies; they propose to refer to the ESMP in this SEIS. The CESMP will further develop the Environmental and Social Management Plan contained in this SEIS and will detail measures for all impacts covered in the ESMP including but not limited to traffic management, waste management, hazardous material, and waste management and occupational health and safety. Safety measures include those as they relate to minimizing sexual harassment and sexual exploitation and abuse. The PMU will review and approve the CESMP before the commencement of construction.
495. The contractor will appoint two Environmental and Safety Officers (ESO), a male and a female, who will be responsible for site inspections on a daily and weekly basis to check compliance with the approved CESMP and ensuring implementation of all occupational health and safety requirements as well as community engagement. Findings from site monitoring will be documented and subject to further follow-ups and investigations by PMU and DNCPIA as guided by the project's ESMP. Key responsibilities of the Contractor include:
- Participate in the induction of the ESMP and mitigation measures to be delivered by PMU prior to preparation of the CESMP. In addition, preparing and submitting for approval, appropriate plans (tree cutting, aggregate extraction, traffic management etc.);
 - Appointing an ESO and Deputy ESO, sending a letter to PMU confirming that these positions have been filled before construction commences (bidding documents and contract to specify the roles and tasks of the ESO);
 - Coordinating with PMU for preparing and submitting the CESMP following detailed design. The ESO will be responsible for ensuring that the Contractor complies with the clauses in the contract and bidding documents in respect of the Health, Safety and Environment (HSE);
 - Engaging an approved service provider to undertake STIs and HIV/AIDS briefings and awareness raising amongst the contractor's employees and communities, and reporting on the same;
 - Coordinating with PMU in respect of community consultation i.e. establishing GRM.

Undertaking daily and weekly site inspections (by the ESO), recording the findings in a site diary and participating in monitoring and coordinating with PMU to ensure that environmental management activities are reported in Monthly Progress Reports;

- Seeking training and support from PMU on any aspects of environmental management.

Figure10.1: Organizational Structure for Environmental & Social Management



10.3 Assessment of Institutional Capacity

496. The Ministry of Public Work has built up some experience in the preparation of environmental assessment documents and the experience of the conformance to the DNCPIA requirements in recent years; largely as DNCPIA is still developing as the regulatory agency under the Environmental License Law. The MPW and DRBFC's current approach to tackling environmental issues is on a project level basis and varies with the requirements of the funding agency.
497. In Timor-Leste, the environmental assessment process has been established but environmental awareness and capability for the implementation of ESMP in infrastructure projects of both the executing agency (MoF) and the implementation agency (MPW) are still developing. The PMU has accumulated experience with several ongoing road sectors projects for the WB and ADB investments in rehabilitation and improving the road network.
498. The Rural Roads Policy (2009), still awaiting endorsement, has the main objective to "develop rural road infrastructure in an environmentally sustainable way". The needs to institutionalize environmental assessments in the design and implementation of rural roads have been identified and close cooperation with the DNCPIA is anticipated. This policy is focused on rural roads but makes several significant commitments as follows:
- MPW is committed to mitigating negative environmental impacts at all stages of provision and production of the rural road infrastructure;
 - MPW will develop comprehensive guidelines that will be followed by all involved in the planning and development of rural road infrastructure; and

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- MPW will mainstream environmental safeguards into the planning and development of rural road infrastructure, followed up during the implementation.
499. When this policy is supported and applied to other road infrastructure there is a basis for environmental management infrastructure projects in the medium term. However, consultations with the various agencies indicate that there will not be a permanent structure or division to handle environmental concerns in project planning and implementation during the term of this project.
 500. The most significant challenge for environmental management on this Project is the lack of human and financial resources and necessary infrastructure in MPW as the line agency for implementation. The institutional capacity in terms of the environment, currently existing is largely that of the existing PMU created for the implementation of ongoing development partner-funded projects in the transport sector.
 501. The minimum National Environmental Standards have not been declared, however, guidelines already exist and need to be applied. The former practice in MPW was that engineering officers may occasionally be delegated to check environmental matters on an ad-hoc basis but the day to day environmental management of projects is undertaken by the PMU. However, the current MPW's capacity to address environmental issues at the headquarters and regional offices are insufficient. At present, there is two staff employed by PMU with direct responsibility for addressing environmental issues on bank-funded projects.
 502. The in-house capacity in MPW to check the adequacy of the Project EMPs is limited, or that they are being implemented effectively by a Contractor. In the long term, it is recommended that a new unit responsible for environmental management be set up to improve capacity in the Ministry of Public Work.
 503. The proposed capacity building includes (a) awareness training of the MPW and PMU (including management) and contractors on environmental management as per GoTL and WB requirements; (b) capacity building programs to improve the capability of environment staff at all levels in carrying out monitoring and implementing environmental management measures; and (c) capacity building programs on environmental issues including pollution control and guidance on obtaining environmental licenses.
 504. Contractor training workshops will be conducted periodically as every new Contractor is engaged during the first year and every six months for the second and third years, to share experience in the implementation of the works and the monitoring report on the implementation of the EMP, to share lessons learned in the implementation and to decide on remedial actions, if unexpected environmental impacts occur. In the medium to long term as the environmental responsibilities of MPW develop, dedicated staff officers will be trained and developed with the aim of taking over the role currently undertaken by consultants and specialists.

10.4 Impacts Mitigation

505. This SEIS prepared to identify and assess environmental and social impacts and has also set out a range of measures to avoid and mitigate those impacts. The mitigation of impacts during the pre-construction phase will be the responsibility of MPW and the Contractor, the mitigation of impacts during the construction phase will be the responsibility of the Contractor, and the mitigation of impacts during the operations phase will be the responsibility of MPW and DRBFC.
506. Construction Environmental Management Plan (CEMP) will be prepared by the Contractor and submitted to PMU for review and approval prior to the commencement of works. Table 10.4. includes the overall Environmental Management and Monitoring Plan for the Project within a matrix of mitigation measures and responsibilities of implementation. Parts of the ESMP such as the pre-construction and construction elements - will be used following completion of detailed design, as the basis for the

contractor's CEMP. The overall process is shown previously in Figure 10.1. Costs have been included where these are known. A number of mitigation measures will be the responsibility of the Contractor who will be required to identify the best means for mitigating an impact and include these in the CEMP, therefore these costs will be borne by the Contractor as part of the construction cost (Included in the Contract).

Table10.2. Responsibilities for Environmental Management and Monitoring

AGENCY	RESPONSIBILITIES
Ministry of Public Works (MPW)	▪ Overall responsibility for project construction and operation; ▪ Ensure that funds are available to properly implement all agreed environmental safeguards measures; ▪ Ensure that the project, complies with the provisions of WB's Operational Policy (OP); ▪ Ensure that Project complies with GoTL environmental laws and regulations; ▪ Ensure that tender and contract documents for civil works include all relevant parts of the environmental assessment and project agreements; ▪ Submit at least quarterly safeguards monitoring reports to the World Bank.
Project Management Unit (PMU)	▪ Ensure that ESMP provisions are implemented to mitigate environmental impacts to acceptable levels, and ensure that Project complies with WB's OP (2011) and government laws and regulations; ▪ Engage and retain two staff within PMU as environmental safeguards officer (ESO) and social safeguards officer (SSO); ▪ Ensure that environmental protection and mitigation measures in the SEIS and ESMP are incorporated into the detailed design including climate change adaptation measures; ▪ Ensure that requisite measures from the SEIS and ESMP are incorporated into the bid and contract documents; ▪ Undertake environmental management capacity building activities for MPW and orientation and awareness training for contractors; ▪ Ensure that MPW has obtained the necessary environmental license(s) from DNCPIA/DEIA prior to award of civil works contracts; ▪ Ensure that contractors obtain a necessary environmental license(s) from DNCPIA/DEIA prior to the commencement of civil works contracts; ▪ Assist MPW to establish an environmental Grievance Redress Mechanism, as described in the SEIS, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Project's environmental performance; ▪ To monitor the implementation of the ESMP (mitigation and monitoring measures); ▪ Prepare quarterly or semi-annual environmental monitoring reports for submission to the World Bank; ▪ Based on the results of ESMP monitoring, identify environmental corrective actions and prepare a corrective action plan, as necessary, for submission to WB and other co- financiers as necessary; ▪ Implement all mitigation and monitoring measures for various project phases specified as PMU's tasks in the ESMP; ▪ Work with DRBFC to undertake any additional environmental assessment for Projects prior and submit to WB and DNCPIA for review and clearance.

AGENCY	RESPONSIBILITIES
Project Implementation and Supervision Consultant (PISC)	▪ Provide training and capacity building to MPW and PMU staff (including management) and provide training to contractors prior to the submission of contractor's CESMP; ▪ Engage and retain two full-time staff within PISC as national environmental consultant officer (NEC) and national social safeguards consultant (NSC); ▪ Incorporate into the project design the environmental protection and mitigation measures identified in the EMP for the design stage including climate change adaptation measures included in the SEIS; ▪ During the detailed design phase provide all necessary information to the MPW to facilitate obtaining environmental licenses from DNCPIA prior to award of civil works contracts; ▪ During detailed design notify PMU of any change in alignment or project design/components and provide all necessary information to the PMU to facilitate preparation of any additional environmental assessment prior to project construction as required in the ESMP (e.g., preparation of new or supplementary environmental assessment in case of change in alignment that will result in adverse environmental impacts that are not within the scope of the SEIS prepared during loan processing, etc.); ▪ Update, based on detailed design, the ESMPs and other environmental protection and management measures to be incorporated in bid and contract documents; ▪ Assist PMU in the review and approval of the Contractor's CESMP for each road section; ▪ Assist PMU to undertake monitoring of the implementation of the ESMP (mitigation and monitoring measures) including the incorporation of reports from the contractors; ▪ Assist PMU to prepare quarterly progress reports and semi - annual safeguards monitoring reports for submission to WB and MPW as necessary including the incorporation of reports from the contractors and corrective action requests to Contractor; ▪ Based on the results of Construction ESMP monitoring, identify environmental corrective actions and prepare a corrective action plan, as necessary, for submission to WB and other co-financiers as necessary.
Contractors	▪ Participate in the induction training on ESMP provisions and requirements delivered by the PMU; ▪ Prepare the CEMP and submit to PMU for approval; ▪ Obtain necessary environmental license(s) from DNCPIA for associated facilities for Project works, quarries, Asphalt Mixing Plant etc. prior to the commencement of civil works contracts; ▪ Ensure that all workers, site agents, including site supervisors and management participate in training sessions delivered by PMU and PISC. Maintain a record of training and conduct of awareness sessions for staff to ensure compliance with environmental and safety statutory and contractual obligations including the approved CESMP; ▪ Ensure compliance with environmental statutor and contractual obligations and proper implementation of the WB requirements including approved CESMP;

AGENCY	RESPONSIBILITIES
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- Prepare environmental monitoring reports covering the above and prepare and submit inputs for the Quarterly Progress Reports.
511. Responsibilities for the implementation of the monitoring requirements of this SEIS are shown in Tables 10.2 and the ESMP Table (10.4). Implementation of mitigation measures during the construction phase will be the responsibility of the Contractor in compliance with the bid documents, contract clauses, and technical specifications. The monitoring plan is incorporated into the ESMP and is presented in Table 10.4.

10.6 Environmental Management Costs

512. The estimated costs for environmental management include costs for staffing, mitigation, monitoring during construction and permitting costs. Most mitigation measures during the construction phase have been included in all pay items of the unit prices of the contract and are covered by the Contractor. Implementation of mitigation measures will be part of the construction costs and will be included in the Bill of Quantities (BoQ) as a monthly line item for implementation of Construction ESMP. The budget for land acquisition and resettlement including asset removal is provided in a standalone Resettlement Action Plan.

Table 10.3. Estimated Costs for ESMP Implementation

ACTIVITIES and PERSON MONTH	ESTIMATED COST (US\$)	COSTS COVERED BY
Technical Assistance – Project Implementation and Supervision Consultant (PISC)	500,000	Contract
International Environmental and Social Consultant in PISC ESC – 6 months intermittent	72,000	PISC
Environmental and Social specialist in PISC ESC – 24 months full-time	50,000	PISC
Environmental impact monitoring	50,000	Contract
CEMP implementation (construction mitigation measures) ¹	150,000	Contract
Capacity Building Program (community awareness, engagement and consultation, HIV/AIDs campaign etc)	30,000	PMU
Environmental Permitting ²	TBC	MPW/PMU
Tree planting subject to confirm at the detailed design	TBC	Contract

Notes:

- 1 Assumes \$ 6,250 per month for 24 months;
- 2 Expenditure on the environmental licensing procedure is the responsibility of the state according to Article 43 of DL5/2011, therefore, cost of permits for an environmental license as clearance certificate under DL5/2011 required from DEIA should be nil.

Table 10.4. Environmental and Social Management and Monitoring Plan

IMPACT MITIGATION					IMPACT MONITORING		
Project activities	Environmental Impact	Mitigation measures to be included in EMP	Mitigation Responsibility	Mitigation Cost	The parameter to be monitored	Frequency & means of verification	Monitoring Responsibility
PRE-CONSTRUCTION PHASE							
Land Acquisition	Social disruption	Cash compensation for assets & resettlement for housing (if possible)	MPW/PMU	in the Resettlement Plan	PAP who received compensation	Before the commencement work – RP implementation	PISC, PMU
Climate change adaptation	Risk of increased erosion and damage to road infrastructure	Ensure all measures incorporated in design as included in Contract are implemented: ▪ Increase capacity of transverse drainage system by clearing, repairing, replacing relief culverts, and add a number of culverts; ▪ Improved longitudinal drainage by lining drains and providing larger culvert; ▪ Erosion protection by using bio-engineering check dams in streams; ▪ Increased maintenance in response to the faster rate of physical deterioration.	PISC, PMU Design Contractor	Include in the Project Contract (IIC)	Climate change adaptation measures incorporate into DED	Visual inspection	PISC, PMU
Surveying and demarcation of center-line	Loss of vegetation during demarcation	▪ Tree cutting will be minimized, especially of trees along the river banks and road-side. Major trees (especially in suco areas) will be clearly marked, only marked trees will be cut; ▪ Contract documents and technical specifications include clauses expressly prohibiting the felling of trees by construction workers for the term of the project; ▪ Construction workers will be informed about general environmental protection and the need to avoid unnecessary felling of trees wherever possible.	PISC, PMU Contractor	Include in the Project Contract (IIC)	Vegetation area: area of felled trees/ vegetation removal	During survey and activities – visual inspection before, during and after	Contractor; PISC, PMU
Site clearing, digging, and excavations	The accidental discovery of cultural property sites	▪ The CEMP to include a section on “chance finds”; ▪ Site agents will be instructed to keep watching for relics in excavations; ▪ Should any potential items be located, the PISC will immediately be contacted and work will be temporarily stopped in that area; ▪ The PISC will determine if that any potential significance and contact MPW to pass the information to the Secretary of State for Culture,	Contractor	Include in the Project Contract (IIC)	Sites or resources discovered and protection actions	During site clearing activities – stop work order; site dealt appropriately	Contractor; Secretary of State for Culture/PMU, PISC

		that will be invited to inspect the site and work will be stopped to allow time for inspection.					
	Removal of trees	▪ Consultation with owner and compensation payment as per the Resettlement Plan (RP); ▪ Cut timber shall not be used for fuel. It shall be removed or returned to the owner; ▪ The Contractor will be responsible for providing adequate knowledge to construction workers in relation to existing laws and regulations regarding illegal activities including logging, hunting, and poaching of wild animals and collection of fauna and birds' eggs. ▪ The Contractor is responsible to appoint a bird specialist with thorough knowledge of avifauna in Timor Leste region to observe and examine the presence of bird's nest prior to trees removal with the following steps: ▪ There are several ways to detect bird nests: 1) look on the ground for concentrations of white-colored droppings, then check the vegetation above; 2) look for birds flying out of vegetation close to the observer and intensely watching the observer as the birds may have a nest nearby; 3) sit quietly and watch for birds that may be bringing nest material or food repeatedly to one place. Birds tend to place their nests just on the undersides of the tree canopy and where branches join together. If adult birds are observed flying to and from a nest, or sitting on a nest, it can be assumed that the nest is active. ▪ A good rule to abide by is to delay construction activity that would occur within 300 feet of an active nest until the nest is no longer active. ▪ Tree trimming, and pruning must be stopped any time there are active nests observed in the tree. ▪ Keep watching on the active nest, and when the chicks have left the nest and activity is no longer observed around the nest, it is safe to continue construction in the nest area or trim the tree. ▪ The bird specialist could provide other mitigation options to be implemented by the project.	PISC, PMU	in the Resettlement Plan	No residual effect of loss; owner satisfaction with compensation	Following the provision of compensation	PISC, PMU

Timor-Leste Road Climate Resilience Project (TLRCRP) Branch Road Section Aituto – Hatubuilico – Letefoho – Gleno
SIMPLIFIED ENVIRONMENTAL and SOCIAL IMPACT STATEMENT

Mobilization of Contractor, construction workers, camp establishment	Social disruption	▪ Consultation with local authorities and women local representatives ▪ Suco (village) protocols should be discussed with workers as part of awareness and mobilization with clear identification of discriminatory social norms which workers shall be instructed not to follow; ▪ Promote actions to ensure compliance with Code of Conduct, including disciplinary measures ▪ Workers should respect village & land owner's boundaries; be cognizant of village rules & terms of conduct (especially in addressing women & elders), avoiding damage to productive trees and gardens, including access to the resources & springs; ▪ The Contractor must ensure that workers' actions outside work site comply with relevant laws, including the observance of Suco codes and culturally determined rules of conduct, as long as these are not discriminatory against women or discriminate on other grounds; ▪ The Contractor will identify two members of their staff, male and female, to be the liaison between the Suco chiefs, elders and contractor, as well as between the Contractor and PISC; ▪ Worker camp location & facilities located at least 500 m from the settlement and agreed with local communities; ▪ Facilities approved by PISC and shall manage to minimize impacts; ▪ Adequate safety sign and security provided at the site office/works yard and prevention of unauthorized entry by children; ▪ Contractor hiring and training as many local workers as possible, including training on GBV	Contractor	Include in the Project Contract (IIC)	Incidents between worker & villager, community complaints, children number entering camp; the effectiveness of safety signs	During Contractor mobilization and related activities – check records of complaints, consultation with workers about protocols	PISC, PMU
	Employment opportunities for individuals at local level	▪ Promote equal access to opportunities thorough minimum percentage of women and persons with disabilities in Bidding documents; Consultation with local authorities and women local representatives; Consultation with relevant CSOs and associations [Women Engineers, Women Business Association, ADTL, RHTO]	Design Contractor		Percentage of women and person with disabilities workers	Include in the Project Contract (IIC)	PMU/MPW
	Health & Safety	▪ Provide adequate housing for all workers at the construction camps with clean canteen and cooking areas. Contractors shall ensure separate housing and sanitary facilities for men and women and reasonable accommodation made for persons with disabilities; ▪ Provision of drinking water, clean water, hygienic	Contractor	Include in the Project Contract (IIC)	Construction camp, maintenance yard, streams or rivers	Monthly monitoring – social observer. and consultation	Contractor PISC, PMU

		toilets with enough water supply, and first aid facilities; ▪ Separate toilets shall be provided for male and female workers. Install portable lavatories (or at least pit latrines in remote areas);					
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		▪ Provision of drinking water, clean water, hygienic toilets with enough water supply, and first aid facilities; ▪ Separate toilets shall be provided for male and female workers, with bins to dispose of sanitary napkins and sinks or buckets and running water for washing reusable cloths available for female workers; ▪ Install portable lavatories (at least pit latrines in remote areas); ▪ Access for workers with disabilities to facilities (reasonable accommodation measure) should be envisaged, in dialogue with a Disabled Persons Organization (DPO) present in the area.; ▪ Prohibition of open defecation, use of lavatories encouraged by daily cleaning; keeping lavatory facilities always clean; ▪ Wastewater effluent from Contractors' workshops and equipment washing yards will be passed through gravel/sand beds. All oil/grease contaminants shall be removed before discharging it into natural streams; ▪ Oil and grease residues shall be stored in drums awaiting disposal in line with the agreed waste management section of the EMP; ▪ Predictable wastewater effluent discharges from construction works shall have the necessary permits from DNCPIA and local authorities before the works commence; ▪ Food shall be provided from farms nearby, and bushmeat supplies from protected areas will be banned to discourage poaching; ▪ Hunting equipt. & usage of a gun by workers will be banned. Dismiss workers who taking or using green timber/hunting/in possession of wildlife; ▪ Entry to the protected areas, IBAs and/or sensitive areas by workers will be banned; ▪ Adequate protection to the general public in the vicinity of the work site, including advance notice of commencement of works, installing safety barriers if required by villagers, and safety signs or marking of the work areas; ▪ Provision of safe access across the works site to people whose suco and access are temporarily affected during construction works.					
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	The spread of communicable diseases	- Construction camp will be established outside areas protected for their biodiversity and in areas with adequate drainage in order to prevent water logging at the camp and mosquitoes breeding sites, to facilitate the flow of the treated effluents; - Contractor to implement of awareness and prevention program. Implementation of HIV/AIDS awareness and prevention program – community.	Contractor and Approved service provider	TBA	STI/HIV/AIDS prevalence Increased awareness about transmission and prevention	During const phase – check contractor records, consultation, and discussion with employees and NGO	PISC, PMU
	Establishment of quarries and borrow pits.	Provision of maintenance yard and other associated facilities such as quarry, crushers, batching plant, and asphalt mixing plant shall be located outside any areas identified by the authorities to be protected for biodiversity or landscape values, include any designated protected areas or national parks.	Contractor	Include in the Project Contract (IIC)	The condition of maintenance yard and other associated facilities	Monthly monitoring – visual inspection	Contractor PISC, PMU

IMPACT MITIGATION					IMPACT MONITORING		
Project activities	Environmental Impact	Mitigation measures to be included in EMP	Mitigation Responsibility	Mitigation Cost	The parameter to be monitored	Frequency & means of verification	Monitoring Responsibility
CONSTRUCTION PHASE							
Operational of construction plant and vehicles	- Emission of vehicles and machinery exhaust; - Dust from crushing plant; heavy vehicles transport materials on roads; Uncovered loaded trucks, and from exposed stockpiles	- Construction equipment shall be maintained to a good standard. The equipment will be checked at regular intervals; checks will be recorded by the Contractor as part of environmental monitoring; - Prohibition of equipment and machinery that causes excessive pollution (i.e. visible smoke) at the Project site; - Material stockpiles being in sheltered areas and are covered with tarpaulins or other such suitable covering to prevent material from becoming airborne disease; - Ensuring that all vehicles transporting potentially dust-producing material are not overloaded and provided with adequate side boards and are adequately covered with a tarpaulin during transportation. This is especially important when passthrough several sucos along the road; - Damping of the road, especially in the vicinity of the sucos along the road and any roads being used for haulage of materials, during the dry season; and - Periodic qualitative air quality monitoring.	Contractor	Include in the Project Contract (IIC)	Air quality: emissions, dust, particulate matter. Use of tarpaulins on the loaded vehicles, and in stockpiles area.	Monthly or after complaint – periodic visual inspection; any particulate matter & smoke are managed as per EMMP	Contractor, PISC, PMU
Works adjacent to or in the rivers and streams areas	- Riverbanks erosion; - Change of river water flows include level and velocity; - Change of channel depth, structure & location resulting from excavations; - Changes of riverbanks; - Increase of river water turbidity due to extraction; - The increase of siltation at culverts; - Construction materials washed	- Material stockpiles will not be located within riverbeds or the islands in the center of rivers; or within the current area of the floodplain of rivers in areas subject to regular flooding; - All land will be rehabilitated to its original or better condition upon completion of the works; - Scour protection will be used as temporary measures to ensure temporary structures do not damage river configuration; - Movements of vehicles and machinery, and hence disturbance, within the riverine habitats, will always be minimized; - If the Contractor causes damage to the river bank or other structural parts of a river, shall responsible for repairing the damage and/or paying compensation; - Embankments and in-stream/river activities will be monitored during construction for signs of erosion;	Contractor	Include in the Project Contract (IIC)	Temporary structures removed; River training/scour protection; No stockpiling in riverbeds, river islands or floodplains; Flooding frequency; Localized erosion	Monthly or as required after the event; Check designs; Visual observation of culverts, bridges and in-stream/river work areas; Consultation with users	Contractor, PISC, PMU

	out into rivers and other areas	- Re-vegetation with local species or other plants in consultation with the landowners and suco chiefs, will be carried out after working within any river habitat has been completed; and - Spoils, rubbish or any material will not be disposed of down slopes or above the project road or within any river system include riverbed, banks or floodplain areas; - Suitable disposal sites will be designated in consultation with the PISC if environmentally acceptable and structurally safe; only after landowners and suco chiefs have provided written, permission endorsed by the PMU.					
Extraction of materials (gravels, aggregates etc.)	- Change of hydrology channel and erosion; - Borrow pits leave unstable land, exposed water table, attracts rubbish dumping, reduces visual values	- Contractor to prepare materials extraction plan with quarries and borrow pits located outside areas protected for biodiversity; - Suitable quarry and borrow pit sites will be designated in consultation with the Engineer (PISC) if environmentally acceptable and structurally safe; only after landowners and suco chiefs have provided written permission endorsed by the Engineer (PISC); - Establishment of quarries, crushers, concrete batching plant, and AMP shall be disclosed to the National Directorate of Environmental, follow the requirements of Decree Law 05/2015 and obtain an environmental license, if necessary; - Stockpile topsoil for later use and fence and re-contour borrow pits after use; - Properly remove topsoil, overburden, and low-quality materials and stockpile near the site to be covered and preserved for rehabilitation; - Use quarry with the highest ratio between extractive capacity (both in terms of quality) and loss of natural state; - Use quarry sites lying close to the alignment, with a high level of accessibility and with a low hill gradient; - Reinstatement damaged access roads, agricultural land, and other properties due to the transport of quarry/borrow materials, other construction materials and any other project-related activities upon completion of construction works at each section; - Provide adequate drainage to avoid accumulation of stagnant water during quarry/borrow site operation;	Contractor	Include in the Project Contract (IIC)	Materials only obtained from designated sites (locations and method) as per extraction plan. Rehabilitation is conducted as per the extraction plan	Monthly - visual inspection; review of the extraction plan; re-vegetation and rehabilitation	Contractor, PISC, PMU

		▪ Avoid or reduce the sections of quarry sites located on the river bed. If not possible to locate quarries out of river beds, quarry sites lying on small rivers and streams shall be avoided; ▪ Alluvial deposits, gravel, cobbles, and boulders shall not be removed (i) within 200 m upstream or downstream for any bridge and (ii) within 10 m of the bank of the river (iii) within wet areas of the river bed (iv) deeper than 1 m from the original bed level; ▪ Choose alluvial terraces or alluvial deposits which lie on the river beds; that not covered by water in normal hydrological conditions; ▪ Cut berms and terraces after extracting of quarries in the mountainous or hilly areas, and implement a drainage system and vegetation cover for rehabilitation; ▪ Dewater and fence quarries and borrow pits as appropriate, upon completion of the extraction activities to minimize health and safety risks; ▪ Ensure borrow pits are left in a tidy state with stable side slopes and proper drainage in order to avoid creation of water bodies favorable for mosquito breeding; ▪ Prevent accidental access and avoid drowning when pits become water-filled by implementing measures: fencing and flotation devices; ▪ Additional extraction sites and/or borrow pits will not be opened without the restoration of those areas no longer in use; ▪ The excavation and restoration of sites and borrow areas will be undertaken in an environmentally sound manner to the satisfaction of the PISC and PMU; ▪ Sign-off to this effect by PISC and PMU will be required before final acceptance and payment under the terms of the contract.					
Spoil disposal	Impacts to habitats and watercourses (damage of land/plantation areas and waterways)	▪ Contractor's CEMP to include a section on spoil disposal; ▪ Spoil will not be disposed of in rivers and streams or other natural drainage paths; ▪ The soil surplus shall not be stockpiled at the roadside or dumped over intensive barriers; ▪ Spoil will not be disposed of on fragile slopes, floodways, wetland, farmland, forest, culturally sensitive areas or where livelihood is derived;	Contractor	Include in the Project Contract (IIC)	Damages on land habitats and/or watercourses	Monthly – visual inspection, and review of complaints on soil disposal activities	Contractor, PISC, PMU

		- Surplus spoil will be used where practicable for local repair works to fill eroded gullies and depression areas and degraded land in consultation with the local community; - Spoils shall only be disposed to areas approved by local authority. Random and uncontrolled spoil disposal or any material, will not be permitted; - Spoil dumping areas will be designated in consultation with the Engineer; if environmentally acceptable and structurally safe, only after landowners and suco-chiefs have provided written permission endorsed by the Engineer; - Before dumping commences spoil, areas will be marked on a plan and in the field (marker poles/ flags) to define the agreed areas and limits for disposal. The spoil disposal site shall be located at least 50 m from surface watercourses and shall be protected from erosion by avoiding the formation of steep slopes and grassing; - Spoil will be disposed of into unused quarries and abandoned borrow pits where practicable; - Disposed spoil will be spread in 15 cm layers and compacted to optimum moisture content, covered with topsoil, landscaped and provided with drainage and vegetation to prevent erosion in line with best practice; - Spoil disposal shall not cause, collapse or erosion of hillsides, sedimentation, and obstruction of the flow of watercourses, damage to agricultural land and densely vegetated areas; - Under no circumstances, unused material will not be dumped into watercourses (rivers, streams, drainage, irrigation canals, etc.).					
Clearing, grubbing, cut-fill activities; construction of embankments; materials stockpile	Soil erosion and silt generation; increased runoff; sediment contamination of rivers	- All required materials will be sourced in strict accordance with GoTL guidelines and the EMP; - Material stock-piles borrow pits and construction camps will only be located on unused land or non-agricultural land following consultation with PISC and PMU, landowners and suco chiefs; - All land will be rehabilitated to its original or better condition upon completion of the project; - Re-use excavated material wherever possible; - If the Contractor causes damage to agricultural land, productive land or gardens, it shall be responsible for repairing the damage and/or paying compensation based on the rates in the approved resettlement plan;	Contractor	Include in the Project Contract (IIC)	Reduced erosion; culverts replaced; reduce flooding; vegetation lost minimized; no garden/agriculture land used; no dumping sites near waterways	Monthly - visual inspection	Contractor, PISC, PMU

		▪ Embankments and in-stream/river activities will be monitored during construction for signs of erosion. Stones should be kept for working in the location of stream or river which can be used if there is channel erosion; ▪ Gabion baskets, rip-rap or bio-engineering methods will be used to both strengthen the road and to prevent erosion at bridge abutments; ▪ Re-vegetation of riverbanks with fast-growing species, or other plants in consultation with the landowners and suco chiefs, after work, has been completed; ▪ Obtaining all necessary permits or approvals for the location of construction camps, material extraction sites and sources of construction materials from DNCPIA and other government agencies prior to works commencing.					
Generation of liquid wastes	Increased siltation at culverts and bridges; Construction materials washed out into rivers	▪ Lubricants will be stored in containers with a sealed floor >50 m from water bodies; ▪ Work in streams/ivers will be scheduled during the dry season and work duration shall be as short as possible. Fragile slopes shall be stabilized immediately after works are completed; ▪ Stockpile and storage areas for hazardous substances shall be located away off water bodies; ▪ Washing of machinery and vehicles in streams/surface waters shall be prohibited; ▪ Provision of sediment control such as silt curtain or other sediment reducing devices to prevent both siltation and silt migration during works being undertaken in the vicinity of streams /rivers; ▪ Sediment control devices will be cleaned and dewatered, discharges will not be to the rivers or streams. Consultation with landowners and suco chiefs will identify suitable land-based areas for settling ponds or discharge areas; ▪ Minimizing interference with natural water flow in rivers, water courses or streams within or adjacent to work sites. Abstraction from and pollution of water resources will not be permitted; ▪ Solid wastes, debris, spent oil/fuel from construction machinery or plant, construction material, or waste vegetation removed from work sites will not be dumped in or near streams, rivers or waterways but shall be collected and	Contractor	Include in the Project Contract (IIC)	Waste discharge as per waste management plan; the occurrence of erosion	Monthly - visual inspection of culverts, and in-stream/river work areas	Contractor, PISC, PMU

		disposed of off to the Government disposal facility at Tibar; - Prohibition of discharging of construction water or material (including dredged spoil) directly into the rivers, inter-tidal area or surface waters. All such construction water will be discharged to settling ponds or tanks prior to final discharge; - Discharge zones from culverts and drainage structures will be carefully identified, and structures will be lined with rip-rap, masonry or concrete; - Spoil and material stockpiles will not be located within 15 m of waterways, streams/rivers, or on the edge of slopes or hills above rivers/streams; - Fuel and other chemicals as required for the works will be stored in secure containers or tanks located away from surface waters or streams; - Any spills will be contained and immediately cleaned up as per the requirements of the emergency response plan prepared by the Contractor (and approved by PISC and PMU).					
General activities - solid and liquid waste generation	Uncontrolled and un-managed waste disposal	- CEMP to include a section on waste disposal, recycling, and re-use; - Areas for disposal to be agreed with local authorities and checked and recorded and monitored by the PISC; - Segregation of wastes shall be observed; foliage, shrubs, and grasses may be given to local farmers for fodder and fuel. - Organic (biodegradables) shall be collected and disposed of on-site by composting. Recyclables shall be recovered and sold to recyclers; - Residual general wastes shall be disposed of in disposal sites approved by local authorities; - Construction/workers' camps shall be provided with garbage bins. Burning of construction and domestic wastes shall be prohibited; - Disposal of solid wastes into floodways, wetland, rivers, other watercourses, farmland, forest, or other culturally sensitive areas or areas where livelihood is derived canals, agricultural fields and public areas shall be prohibited; - There will be no site-specific landfills established by the contractors. All solid waste will be collected and removed from the work camps and disposed of in the Tibar waste disposal site.	The contractor, (PISC and PMU to approve plan)	Include in the Project Contract (IIC)	Waste discharge as per waste management plan; the occurrence of erosion	Monthly - visual inspection of culverts, and in-stream/river work areas	Contractor, PISC, PMU

Use of hazardous materials	- Environmental pollution due to spillage of oil, other hazardous, and chemicals; - Accidents and risks to people or community	- Emergency Response Plan (as part of EMP) prepared by Contractor shall cover hazardous materials/oil storage, spills, and accidents; - Used oil and other residual toxic and hazardous materials shall not be poured on the ground; - Used oil and other residual toxic and hazardous materials shall be disposed of in an authorized facility off-site; - Disposal of waste oil and lubricants shall be to the Tibar waste disposal facility operated by DNCPIA; - Ensure that safe storage of fuel, other hazardous substances, and bulk materials are agreed by PISC and have necessary approval from DNCPIA and local authorities; - Toxic material and explosives (if required) will be stored in adequate protected sites consistent with national and local regulations to prevent soil and water contamination; - Equipment/vehicle maintenance and refueling areas will be confined to areas in construction sites designed to contain spilled lubricants and fuels. Such areas shall be provided with drainage leading to an oil-water separator that will be regularly skimmed off oil and maintained to ensure efficiency; - Fuel and other hazardous substances shall be stored in areas provided with a roof, impervious flooring, and containment wall to protect these from the elements and to readily contain spilled fuel/lubricant; - Segregate hazardous wastes (oily wastes, used batteries, fuel drums) and ensure that storage, transport, and disposal shall not cause pollution and shall be undertaken consistent with national and local regulations; - Ensure all storage containers are in good condition with proper labeling. Regularly check containers for leakage and undertake necessary repair or replacement; - Store hazardous materials above flood level; discharge of oil-contaminated water shall be prohibited; - Adequate precautions will be taken to prevent oil/lubricant/ hydrocarbon contamination of river channel beds;	The contractor, (PISC and PMU to approve plan)	Include in the Project Contract (IIC)	EMP and emergency response plan; Ensure storage sites are using existing concrete base; Spills cleaned, and area rehabilitated	Monthly or after the event or as required - review and approval of an emergency response plan; Visual Inspection of storage facilities;	Contractor, PISC, PMU
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		▪ Ensure availability of spill clean-up materials specifically designed for petroleum products and other hazardous substances where such materials are being stored; ▪ Spillage will be immediately cleared with utmost caution to leave no traces. Spillage waste to disposal sites approved by local authorities and approved by PISC; ▪ All areas intended for storage of hazardous materials will be quarantined and provided with adequate facilities to combat emergency situations complying with all the applicable statutory stipulation; ▪ The contractors shall identify personnel in their EMP in-charge of storage sites for hazardous materials and ensure they are properly trained to control access to these areas and entry will be allowed only under authorization.					
Encroachment into precious ecology, disturbance of terrestrial habitats	Workers poach animals for food or feathers etc.; Protected or sensitive areas affected	▪ Contractor's site office, works yard, stones crushers, material storage, borrow pits, and quarries will all be approved by PISC and will not be permitted in any ecologically important sites or areas valuable for conservation including the Ramelau Mount protected area; ▪ Vegetation clearance during construction activities, especially of trees along the river banks and road-side, will be minimized; ▪ Under no circumstances is the contractor permitted to fell or remove woodland and forests; ▪ Vegetative cover cleared from the roadside during rehabilitation activities will be kept for re-vegetation. Contractors will be responsible for re-vegetation in cleared areas; ▪ The Contractor will responsible for providing adequate knowledge to construction workers in relation to existing laws and regulations regarding illegal logging; ▪ Contract documents and technical specifications will include clauses expressly prohibiting the poaching of fauna by construction workers and making the Contractor responsible for imposing sanctions on any workers who are caught trapping, killing, poaching or having fauna; ▪ The PISC will supervise and monitor a ban on the use of forest and timber and workers shall be prohibited from cutting trees for firewood;	Contractor	Include in the Project Contract (IIC)	Check for poaching and unnecessary vegetation clearance; Re-vegetation of work areas; Adequate fuel supplies in camp;	Monthly - visual inspection of camp and work sites; Re-vegetation activities as per EMP; Consultations with villagers and workers	Contractor, PISC, PMU

		Construction workers will be informed about general environmental protection and the need to avoid unnecessary felling of trees wherever possible.					
Operation of construction plant and equipment creating noise	Noise in the community; Impacts on construction workers	- Requirements in the EMP and contract documents that all vehicle exhaust systems and noise generating equipment be maintained in good working order and that regular equipment maintenance will be undertaken; - The Contractor will prepare a schedule of operations that will be approved by suco chiefs and PISC. The schedule will establish the days, including identifying days on which there should be no work, and hours of work for each construction activity and identify the types of equipment to be used; - Workers will be provided with personal protective equipment for noise abatement equipment as may be required; and - Any complaints regarding noise will be dealt with by the Contractor in the first instance through the Grievance Redress mechanism (GRM).	Contractor	Include in the Project Contract (IIC)	Adherence to agreed schedule; Complaints (no. logged with resolution); Workers safety equipment	Monthly or after complaint - review schedule Consultation (ensure schedule is adhered to) GRM register	Contractor, PISC, PMU
Presence of vehicles and equipment in villages, use of people's land for access to the construction site, traffic and safety issues	Traffic and access disrupted during construction; Traffic safety affected	- The Contractor will prepare a traffic management plan as part of the CESMP detailing diversions and management measures; - Signs and other appropriate safety features will be used to indicate construction works are being undertaken; - Care must be taken during the construction period to ensure that disruptions to access and traffic are minimized and that access to villages along the project road is always maintained; - Provincial Works and village officials will be consulted if access to a village has to be disrupted for any time and temporary access arrangements made; - Construction vehicles will use local access roads or negotiate access with landowners, to obtain access to material extraction sites. Where local roads are used, they will be reinstated to their original condition after completing work; - The Project road and haul routes will always be kept free of debris, spoil, and any other material; - Disposal sites and haul routes will be identified and coordinated with local officials; - Provision of adequate protection to the general public in the vicinity of the work site, including advance notice of commencement of works,	Contractor, Sucos	Include in the Project Contract (IIC)	No. of accidents or events; Maintenance of access; Signage; Road free of materials and debris; Haulage routes rehabilitated	During activities - Visual inspection; Consultations; Review of the traffic management plan	Contractor, PISC, PMU

		installing safety barriers if required by villagers, and signage or marking of the work areas; and Provision of safe access across the works site to people whose villages and access are temporarily affected during road re-sheeting activities.					
Construction activities causing accidental damage to existing services	Interference with existing infrastructure; Water supplies contaminated or disrupted through the breaking of pipelines or exposing water table during works	- Consult with service providers to minimize physical impacts on public infrastructure and disruption to services; - Reconfirm power, water supply, and irrigation systems likely to be interrupted by the works and any additional trees to be cut near utilities; - Contact all relevant local authorities for utilities and local village groups to plan re-provisioning of power, water supply, and irrigation systems; - Relocate and reconnect utilities well ahead of the commencement of construction works and coordinate with the relevant utility company at the district and district levels for relocation and reconnection well before works commence and include for compensatory planting for trees; - Inform affected communities well in advance; - Arrange reconnection of utilities and irrigation channels in the shortest practicable time before construction commences; and - If utilities are accidentally damaged during construction it shall be reported to the PMU, DRBFC and utility authority and repairs arranged immediately at the contractor's expense.	Contractor	Include in the Project Contract (IIC)	Utilities or public facilities reinstatement; Services re-routed; Service disruptions	As required - visual inspection, consultation with service providers	Contractor; PCMBU
General activities, handling equipment and plant; construction vehicles	Worker health and safety risks	- Experienced environment and safety officer s (ESO) - one male and one female - will be identified by the contractors in the bid, at least one month before construction commences the contractors will demonstrate to the PISC and PMU they are properly resourced for environmental and social monitoring and control; - Establishment of safety measures as required by law, including GBV prevention measures, and by good engineering practice and provision of first aid facilities at work sites, in vehicles and establishment of a first aid/health post at the contractor camp; - The Contractor will conduct training for all workers on safety and environmental hygiene at no cost to the employees, including GBV prevention relevant topic; - The Contractor will instruct workers in health & safety matters as required by law and by good engineering practice and provide first aid facilities;	The contractor, (PISC and PMU to approve plan)	Include in the Project Contract (IIC)	EMP and emergency response plan; Ensure storage sites are using existing concrete base; Spills cleaned, and area rehabilitated	Monthly or after the event or as required - review and approval of an emergency response plan; Visual Inspection of storage facilities;	Contractor, PISC, PMU

		▪ Instruction and induction of all workers in health and safety matters, including road safety as necessary; ▪ The Contractor will instruct and induct all workers in health and safety matters (induction course) including construction camp rules and site agents will follow up with toolbox talks on a weekly basis. Workforce training for all workers starting on site will include safety and environmental hygiene; ▪ Workers shall be provided with appropriate personal protection equipment (PPE) such as safety boots, helmets, reflector vest, gloves, protective clothes, dust mask, goggles, and ear protection at no cost to the workers and in variable size to fit women of smaller stature; ▪ The fence on all areas of excavation greater than 1 meter deep and sides of temporary works shall be observed; ▪ Reversing signals (visual and audible) shall be installed on all construction vehicles and plant. ▪ Provision of potable water supply in all work locations. The fence on all excavation, borrow pits and sides of temporary bridges; ▪ Scheduling of regular (e.g. weekly toolbox talks) to orientate the workers on health and safety issues related to their activities as well as on proper use of PPE; ▪ Where worker exposure to traffic cannot be eliminated, protective barriers shall be provided to shield workers from traffic vehicles. Another measure is to install channeling devices to delineate the work zone; and ▪ Construction camps shall be provided with toilets/sanitation facilities in accordance with local regulations to prevent any hazard to public health or the contamination of land, surface or groundwater. These facilities shall be well maintained and cleaned regularly to encourage use and allow effective operation.					
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Presence of construction workers and public health and safety	Various social impacts including (i) social disruption; (ii) possibility of conflicts or antagonism between residents and workers; (iii) SEA against community members; (iv) spread of communicable diseases including STIs and HIV/AIDS; (v) children are potentially exposed to exploitation; (v) impacts on community health and safety	▪ The contractor will appoint an ESO to address health and safety concerns and liaise with the PMU and sucos within the sub-project area; ▪ Barriers (e.g., temporary fence), and signs shall be installed at construction areas to deter pedestrian access to the roadway except at designated crossing points; ▪ Adequate signage and security provided at the site office and works yard and prevention of unauthorized people (including children) entering work areas and camp. Warning signs will be provided at the periphery of the site warning the public not to enter, in a language understood by the local community and using pictures for widespread understanding; ▪ The general public/residents shall not be allowed in high-risk areas, e.g., excavation sites and areas where heavy equipment is in operation and these sites will have a watchman at the entrance to keep public out; ▪ Speed restrictions shall be imposed on project vehicles and equipment traveling within 50 m of sucos and sensitive receptors (e.g. residential, schools, places of worship, etc.); ▪ Upon completion of construction works, borrow areas will be backfilled or temporarily fenced, awaiting backfilling; ▪ Provisions will be made for site security, trench barriers and covers to other holes and any other safety measures as necessary; ▪ Drivers will be educated on safe driving practices to minimize accidents and to prevent the spill of hazardous substances (fuel and oil) and other construction materials during transport; ▪ Contractors will ensure that no wastewater is discharged to local water bodies; ▪ Measures to prevent the proliferation of mosquitoes shall be implemented. Installation of proper drainage to avoid the formation of stagnant water, standing water will not be allowed to accumulate in the temporary drainage facilities or along the roadside; ▪ Contractor to ensure the construction workforce attends STI and HIV/AIDS prevention workshops provided through an approved service provider; ▪ The contractor should secure Code of Conduct compliance and provide awareness and policy towards children protection, vulnerable people, sexual harassment, gender-based violence (GBV),	Contractor, Suco Chiefs, PISC, PMU; approved service provider	IIC + costs for program (already identified)	HIV/STIs awareness campaign implemented; ESO recruited; Training implemented; Provision of safety equipment; Signage and security to prevent unauthorized people from entering camp; Signage installed as required;	As required; Monthly or after complaint - ESO recruited; Training records; Staff records; Visual inspection; Consultations with villagers; Checking of complaints; Consultations with workers retraining	Contractor, PISC, PMU
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		including sexual harassment and sexual exploitation and abuse (SEA); ▪ Implementation of efficient and timely disciplinary measures to deal with noncompliance with Code of Conduct ▪ Suco-based community awareness raising about the transmission of STIs and HIV, reproductive health and safe sex. The program will be implemented prior to contractor mobilization. ▪ No child (person under the age of 18 years) labor in the construction work) labor.					
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Site office and works yard and use of water and electricity supplies	Stress on resources and existing infrastructure	- Site office and works yard located, if possible, in areas better supplied with infrastructure and services. - Contractor to supply temporary facilities i.e. health post, accommodation, water and electricity, telecommunications, and sanitation	Contractor	Include in the Project Contract (IIC)	No. concerns raised and resolution; Service supply to camp and office	Ongoing - consult with villages along project road to monitor environmental concerns	
Accidental encroachment into historical/cultural sites	Impacts on PCR or cultural property sites	- Contractor's CEMP to include a section on "chance finds" - Site agents will be instructed to keep a watching brief for relics in excavations. - Should any potential items be located, the PISC will immediately be contacted and work will be temporarily stopped in that area. - The PISC with the assistance of the PMU will determine if that item is of potential significance and contact MPWTC to pass the information to the relevant department in GoTL (i.e. Secretary of State for Culture) who will be invited to inspect the site and work will be stopped to allow time for inspection.	Contractor;	Include in the Project Contract (IIC)	Sites and/or resources discovered and their protection	During activities - stop work order issued; Site/resources dealt with appropriately	Contractor; Sec. of State for Culture/, PISC, PMU

IMPACT MITIGATION					IMPACT MONITORING		
Project activities	Environmental Impact	Mitigation measures to be included in EMP	Mitigation Responsibility	Mitigation Cost	The parameter to be monitored	Frequency & means of verification	Monitoring Responsibility
OPERATION PHASE							
Operation of vehicles	Air pollution increase through increased traffic	Forecasts for traffic growth indicate that emissions will be low and not have a noticeable effect on air quality.	N/A	N/A	N/A	N/A	N/A
Routine and ongoing maintenance	Standing water degrades road and surrounding environment	- Maintenance of structures to ensure river debris does not collect and result in damage to culverts and drainage structures, riverbanks, or land through altered flow patterns (see below); - MPW will negotiate with resource owners and prepare an MoU acceptable to all parties; - Drain and fill areas where water can pool as part of ongoing maintenance activities.	DRBFC; routine maintenance contractor	Include in the Project Contract (IIC)	Condition of road	As required Routine maintenance records; Visual inspection;	MPW/DRBFC; WB

Improved access to previously inaccessible, or difficult to reach, areas	Hunting and poaching increases, potential expansion of settlement in new locations	- Lack of through-route access and low traffic volumes means it is unlikely there will be any impacts on flora and fauna; - There are no rare or endangered species that could be affected by the operation. - The temperature in protected area in Section 2 Hatubuilico-Letefoho with the altitude around 2,000 meter is too low (100-150C) to be habitable. This low temperature and the lack of water resources in the area account for detrimental conditions for the development of new settlements.	DRBFC; routine maintenance contractor	Include in the Project Contract (IIC)	Increases in hunting activity; Reduced sightings of fauna	Visual assessment; Consultations	MPW/DRBFC; WB
Increased traffic and speeding behavior	Increases in noise nuisance for residents; Increased traffic volumes and higher speeds lead to accidents/	- Low traffic forecasts and the low population density means that ambient noise levels will not significantly increase; - General safety will be improved by providing improved pavement surface, and installation of road safety signage; - Awareness raising through village meetings will be needed to create road safety programs; - Ongoing community awareness ascertains village concerns regarding traffic calming management.	MPW/DRBFC;	Include in the Project Contract (IIC)	Accidents and collisions; Safety issues discussed in schools; The effectiveness of traffic calming measures	Visual observations; Complaints; Collect road accident data	MPW/DRBFC; WB
Improved access to tourism activities	Impacts are considered to be positive as increased tourism activities are expected to boost local economy At this stage in Timor-Leste, there does not appear to be strong international potential for larger scale 'fly and flop' stay-put resort tourism (despite this being an extremely massive sector internationally). This is due to the current relatively high cost of holidaying in Timor-Leste (both air access and land costs) and challenges in terms of travel time required compared to competing neighboring	- On-going monitoring by PMU specialists on further road project impacts on the increase of tourism and its downstream environmental and social implications; - Coordination with the Ministry of Tourism for the management of potential adverse impacts, if any.	MPW/DRBFC;	Project Management	N/A	Periodic observations, complaints received.	MPW/DRBFC; WB

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	destinations.						
The spread of communicable diseases	The spread of communicable diseases such as HIV and STIs	At expected traffic volumes risk of spread of such diseases are not expected.	N/A	N/A	N/A	N/A	N/A
Any other	Unintended or unanticipated impacts	As required to avoid or reduce effects or impacts	DRBFC	TBA	TBA	As above, as required	MPW/DRBFC; WB

11. Public Consultation and Information Disclosure

11.1 Introduction and Stakeholders Consultation

482. A series of stakeholder consultations was undertaken September 12th to September 26th following field assessments between July and August 2018 with the objectives to disseminate information on the Project and its expected impacts, long-term as well as short-term and to gather community feedback and their understanding of the project. Another important objective was to determine the extent of the concerns amongst the community can be addressed as part of the project design and what mitigation measures may exist and are supported by the affected communities. The feedback received from stakeholders has been used to address these issues in the early stages of project design.
483. The stakeholders consulted for the Project included villagers as project affected persons, local authorities, suco leaders, customary leaders, national authorities, agriculture and forest institutions, educational institutions, and other interest groups. The Government of Timor Leste's department such as the Department of Protected Areas and National Parks (hereafter PNAP or Plano Estratégico Nacional de Áreas Protegidas) was also consulted. Individuals representing several hundred persons from numerous family groups in the sucos along the alignment were informed about the Project and invited to share their concerns and expectations about the project and its potential impacts. These stakeholders were considered to be representatives of the affected communities, the road users as well as small business owners associated with the road.

11.2 Public Consultations for SEIS

484. Initial engagement with local authorities and interested groups and field assessments were between July and August 2018. Key agencies met include the following:

DATE	INSTITUTION	PERSON IN CONSULTING	MEETING PURPOSE
1 August 2018	MCIA (<i>Ministerio Comercio Industrial e Ambiental</i>)	Director of DNCPIA; Ms. America Maichado	Consult the status of Branch Road Project based on the Decree Law of Environment, and Project Document requirement.
2 August 2018	MAP (<i>Ministerio Agricultura e Pescas</i>)	The direction of SNAP (<i>Sistema Nasional Area Protegidas</i>); Mr. Pedro Pinto and Mr. Luis	Confirm of the boundary of protected area and bird area in Section 1 and 2.
9 August 2018	NGO – Haburas	Chief of Haburas; Mr. Virgilio Guterres	Discuss the infrastructure activities in TL and the role of Haburas on environmental issues in East Timor.
19 October 2018	MAP (<i>Ministerio Agricultura e Pescas</i>)	The direction of SNAP (<i>Sistema Nasional Area Protegidas</i>); Mr. Pedro Pinto	Consult and confirm of GoTL perception regarding the area which allegedly as protected forest area and traverse by Branch Road Project.

485. Following such initial engagement, a series of public consultations was undertaken at 11 (eleven) sucos along the road corridor (covering sections 1, 2 and 3) between September 12 and 26th 2018. These public consultations were attended by residents, suco leaders, customary leaders, church representatives along the Branch Road

- Section, Municipal Administrator, agriculture and forest institutions, educational institutions, water, and sanitation institutions, land and property agency. These consultations were attended by the PMU representatives.
486. The above public consultations were attended by about 450 participants (with 75 women or about 17% of participants) representing all Sucos to be affected as well as related departments of GoTL, representatives of NGOs, officers from local and municipalities, including representatives of veterans and churches. The participants actively involved in the discussions related to the Project's goals, environmental and social issues, as well as the related risk mitigation measures and impact avoidance of sites with historical and cultural values. Women equal participation in consultation meetings showed to be a challenge which the Contractor needs to rectify during the project through proactive steps to engage more women. No data are available so far on participation of persons with disabilities.
487. The key elements in the current public opinion are summarized as follows:
- a) The public generally welcomes the proposed road Project and expressed appreciation of the public consultation events conducted since these provided them with opportunities to raise concerns early on during the project design;
 - b) Water supply facilities such as water pipelines, water tanks and water springs adjacent to the proposed road Project will require protection and/or replacement prior to the construction works. Measures will need to be put in place by the contractor to ensure that services and water supply are not disrupted;
 - c) Employment opportunities were perceived to benefit the communities as expressed in all Sucos. Recruitment is expected to be coordinated by each Suco chief to ensure community access and participation;
 - d) Landslide risks in several critical areas will need to be considered as part of the design development and careful implementation will be needed particularly with regards to slope cutting in areas adjacent to the education facilities;
 - e) Improper soil disposal on the productive land owned by the community (i.e. coffee plantation) is of a sensitive concern.
488. Key concerns and feedback discussed during the public consultations are summarized in Table 11.1. Further documentation, which includes meeting notes and the list of participants are enclosed as Appendix 5.

11.3 Concerns Raised and Responses

Table 11.1. Summary of Main Concerns Raised during Suco-level Public Consultations

CONCERNS EXPRESSED/COMMENTS	HOW CONCERNS ARE ADDRESSED
Generally, local communities are very happy with the proposed road upgrades. They feel the project is beneficial and can support tourism and local economic growth.	Consultation and coordination with local communities will be continued into the implementation stages to preserve the commitment and support of the public.
Water supply is essential for the village community, as they still lack water, though they have pipelines and water tanks. Most of the water tanks are adjacent to roadsides, whereas water pipelines are often rightly located on the roadsides, thus all water supply facilities must be protected prior to the construction works.	Water supply facilities will be identified and inventory during pre-construction and will be replaced or transferred to other places prior to the commencement of works. The utility's reinstatement will be discussed and agreed with the local authority and stated in the Utilities and Infrastructure Section of the Environmental & Social Management Plan (ESMP).
There are sacred places, religious sites, and cemeteries close to the roads. These places must be considered when a road improvement Project will be implemented.	Sacred sites and cultural heritage locations will be considered during detail design. Furthermore, those will be recognized and protected in the ESMP.
There are some concerns and comments asking to build pavement/walkpaths for pedestrians as well as installation of guardrails along steep gorges. There were also expectations that the project will also improve culverts and drainage at the same time.	The road will be widened with sealed hard shoulders, road markings, include safety signs as part of road safety. Footpaths or wider hard shoulders will be recommended in villages, particularly near the schools.
While project affected people do not expect any major impacts, especially related to their house, land and other assets, they signaled support for the road improvement provided that any loss will be duly compensated in a fair and transparent manner. Close coordination with municipal governments, Suco communities and their representatives and leaders, particularly in understanding of project impacts and agreeing on mitigation measures has been requested.	Consultation and coordination with local communities will be continued into the implementation stages in order to maintain agreed commitments and public support of the public. Selected contractor(s) will commit to implementing the agreed mitigation measures identified in the Project's ESMP and their respective CESMPs. Implementation of these plans will be monitored by PMU on behalf of Ministry of Public Work. The GRM will be strengthened to be able to receive and process grievances in a transparent and responsive manner.
Potential impacts such as dusts and improper soil disposal should be minimized through the coordination and consultations with local leaders and community representatives.	The ESMP outlines required mitigation measures for all impacts foreseeable at the preparation stage. However, there is understanding of the need to ensure adaptability of safeguards management to respond to emerging impacts.
Landslide is common due to soil fragility and run-off effects during heavy rains. Communities expected that as part of the project design, installation of retaining walls can be included in the engineering design particularly in road sections with steep slopes and geological	The ESMP requires the DED to incorporate risk mitigation measures in road sections which prone to landslides. During the construction phase, an erosion control plan will be implemented as per ESMP to control run-off as well as avoid slope failures.

instability. If slope cutting and construction are anticipated to generate landslide risks in properties adjacent to the road, these measures must be addressed prior to any construction.

Few communities were concerned about the project's potential impacts on their assets and properties. Close coordination and consultations with local leaders and affected community members are mandatory to agree on mitigation measures as well as compensation packages. Such processes are expected to be conducted in a fair and transparent manner.

Land acquisition and subsequent asset removal are envisaged for road widening. In the event that land acquisition or resettlement are required for the project's purposes, appropriate compensation in line with the World Bank's OP 4.12 will be included in the Land Acquisition and Resettlement Action Plan (LARAP)

There are some houses and water springs to be protected since their locations are close to the main roads. Impact avoidance measures will need to be considered as part of the project's design.

The ESMP outlines relevant mitigation measures for all impacts foreseeable at this stage and impact avoidance measures are to be reflected in the DED.

The public consultation for Timor Leste Branch Road was held by the Government of Timor Leste on May 23, 2019 in Salão Paroquial São José Catedral, Vila Verde, Dili. The objective of public consultation was to enable public participation in the overall project design and enable affected stakeholders to express their views and raise their concerns to enable better and more inclusive design and project implementation in the future. The consultation was attended by 104 people (including 17 women) which consisted of representatives from the affected communities, central and district government officials, NGO/CSO, and academia. The Director General for Public Works Department of Road, Bridges and Flood Control and the Technical Support Team Leader from Project Management Unit facilitated the consultation and invited constructive feedback from all stakeholders.

Participants and Speakers	Comments and Suggestions
Morning Session	
The National Directorate of Land Property and Cadastral Services (NDLPCS)	- Common issues related to land in Timor Leste often stem from community claims. There is a need to collaborate with community leaders who will engage their constituents to support the project; - While the Land Law, while land rights are protected, there is an absence of further technical regulations and guidelines to act on such provisions; - The GoTL is planning to register land claims to ensure due compensation in the event of land acquisition; - There are often cases where communities along the existing road corridors misuse the land although there are Right of Way (ROW) codes of conduct, regulating land use along road corridors; - Key regulations to be endorsed by the parliament include law on land registration, land rights, as well as certification; - At the municipality level, the GoTL is also planning to start the process of land zonation to define and determine allowable land uses. The GoTL is in the process of deliberation to classify land uses;
The National Directorate of Forestry Conservation and Water	- The Directorate is supportive of this project because road upgrades will benefit the communities from improved access and connectivity; - Potential risks on the protected areas, including Mount Ramelau as well as community coffee plantation will need to be carefully

	managed to minimize impacts; • The project can take stock of the previous project experiences (for instance Suai supply base); • The same (road construction) standard as applied by JICA should be replicated; • The project needs to enable collaboration with community leaders to support replanting to prevent construction-induced erosion and/or landslides; • Mount Ramelau represents an important tourism site and the GoTL is currently looking other potential tourism sites around the area; • Land clearing and tree cutting must be conducted in a manner that respect the overall ecosystem to minimize further impacts on other trees; • Selection of road alignment should consider the distance from protected areas to minimize and/or avoid potential impacts, this also includes the siting for quarries, stockpile and spoil disposal area and other associated facilities; • The project should foster local collaboration with community leaders, including with regards to management of potential impacts (i.e. replanting).
Student	• Concerns related to dust related issues, equipment installation, erosion/landslide risks, how to file grievances and what solutions the project can offer to minimize such potential impacts.
Ministry of Tourism, Art and Culture	• The project should ensure adequate considerations to minimize and/or avoid potential impacts on cultural sites; • There is a cooperation with WB in 2010 producing documentation on TL culture that can be used as a reference; • When impacts are envisaged on cultural sites, engagement with communities must be ensured. This includes supporting necessary rituals; • The project should involve relevant departments in the Ministry of Tourism, Art and Culture in the management of potential risks on cultural sites.
Ermera district administrator	• The project in the future will also need cover the Old Ermera town as suggested. Impact on coffee trees will need to be addressed, noting that prices for such trees may need to be differentiated based on productivity. • The same also applies to other trees which may warrant different pricing categories as well as other agricultural commodities, such as cassava. • The bottom line is to ensure differentiated price categories for trees affected based on their types and productivity.
<u>Responses by Panel</u>	An initial impact assessment for the project has involved the Ministry of Tourism, Arts and Culture. The assessment has consulted with PAPs on minimizing impacts, i.e. cases of traditional sites in Ermera in Section 3. The panel confirmed that the Ministry will always be involved during project implementation. <u>Response from DG of DRBFC:</u> the impact assessment has involved relevant parties. The questions and concerns raised by the participants are relevant to fill gaps in the current analysis. Community leaders (Suco Chiefs) have been and will continue to be engaged during project implementation.

	<u>Response from the Ministry of Forestry:</u> price classification for affected trees has been identified based on tree commercial values. If the trees are currently in the list of compensation, then the Ministry of Agriculture will further assess. The existing list has been provided to the Ministry of Public Works. <u>Response from the road PMU:</u> environmental related impacts will be discussed in the afternoon section. The list of compensation entitlements has been developed and is accessible for the public and can be requested from the PMU. There will be another phase where PAPs have the ability to negotiate pricing for trees, structures. In the case of land compensation, the prices will need to be determined by the National Directorate of Land and Property and Cadastral Services (NDLPCS)
Department of the Environment	Question whether there is any additional assistance beyond compensation. For instance, replanting assistance. In conducting impact assessment processes, the project needs to involve other line ministries
NGO Luta Hamutuk	- There have been reports from the ongoing road project that PAPs were dissatisfied with the compensation. Not all trees affected were compensated. Other unidentified impacts, such as erosion, were also not properly addressed. - On the ground realities often differ from the plan.
Suco Representative	Defined zones may not exist amongst Sucos, which tend to result in competing ownership claims by other Sucos.
Panel Response	<u>Response from the DRBFC:</u> - Clarifications were provided with regards to project impacts being raised by NGO Luta Hamutuk which refer to the GoTL-financed road projects, not the WB and ADB; - Additional compensation for unintended impacts will be paid by the contractor and/or GoTL; - Engineering team will be available on site and hence communities are able to report if there are issues or register their feedback; - Compensation payments will be made through Bank transfer to avoid/minimize leakages and/or unsolicited kickbacks; - There will be a rotation for labor to enable broader participation of the communities. Response from the NDLPCS: all land and associated properties on land fall under the responsibility of NDLPCS. Suco boundary demarcation has been made to minimize conflict and overlapping claims amongst Suco.
Community Representative from Ermera	- Question on the prevention and handling of landslides; - Local workers will need to be sourced locally from each Suco; - If there are potential negative impacts on cultural sites, the project must ensure that there are rituals prior to any construction works which result in such impacts.
Administrator of Ermera Municipality	- There is an expectation that the road upgrades can be extended to Fatubesi; - There are particular trees that are typically not compensated and hence, the communities need to better understand the methodology for calculating compensation, particularly coffee trees; - Road potholes which may get worsen during the rainy season may create public safety risks; - Existing drainage sometimes fails to accommodate increasing

	water volumes (run-offs). Retaining walls, if not constructed properly, may collapse in the event of heavy rains; • The project should have strong communication and engagement with community leaders to foster their buy-in. Such coordination also needs to be maintained with the district government as they have veto rights to halt the project.
Ainaro District Administrator	• Coordination issues between the Central and District governments were reported. Contractors often do not follow instructions from the district administration. Hence, a written authorization letter from the Central Government to the District Government is called for to enable the latter in the management of contractors; • Take the lessons learned from Dili-Ainaro road project to Branch Road project; • The project needs to strengthen its engagement with Suco leaders;
The Police Department of Ainaro	• The police involvement is needed to manage traffic and ensure road safety. The police also provide security services to local workers; • To be able to function effectively, an authorization and/or mandate in the management of contractors from the central government to district governments will be needed. • Consultations will also need to target potentially affected people and should be maintained during project implementation; • Communication processes with the community will need to be fostered to enable impact monitoring on the ground through their involvement; • Proper and regular coordination will be critical to prevent potential issues. The Police is often at the forefront of resolving issues and hence, prevention measures through proper communication with <i>Suco</i> and <i>Aldea</i> chiefs should be maintained. Previous projects have taken longer to complete due to poor coordination with <i>Sucos</i>.
Afternoon Session	
Hatubuilico Administrator	• While cooperation between central and municipal governments is key, there is also a strong need to enhance the capacity of municipal governments; • Construction activities should avoid sites of cultural significance such as graveyard in Hatubuilico; • More considerations on work life balance must be given particularly to local workers recruited by Chinese companies; • Management of slope cutting impacts, such as revegetation, will need to be included as part of the project design;
Responses by the Panel	<u>Response from the Road PMU:</u> • On the report of workers' welfare, further understanding and clarifications from the companies concerned will be needed. The PMU will look into labor practices in currently operating companies, such as Chico; • At the time contracts were signed, contractors need to agree on labor management procedures, which includes a FGRM for workers; • Complaints can be addressed through community leaders, and if resolution cannot be achieved at the site level, issues can be elevated to the Central Government; <u>Response from the DNCPA:</u> • Consultation with DNCPA is required to understand management

	aspects with regards to protected areas, forests and fauna that may be at risk of being impacted by the project activities; - Engagement with communities will need to be fostered and prior compensation must be settled prior to any works; <u>Responses from the National Authority of Oil and Minerals</u> - The project needs to ensure that administrative requirements are prepared to enable timely implementation of the project; - Permits on gravel and sand extraction will be contingent upon tax settlements; - In collaboration with the DNCPA, extraction of rocks, and gravels must be equipped with valid licenses; - Fees and payments are regulated by law and are managed by the central government. 1 ton of rocks is priced at 3 USD, whereas sand is 2 USD. All mineral extraction fees will be returned to the public;
Student	Environmental laws need to be strengthened as well as their enforcement to promote compliance.
Department of Geology UNTL	- Question whether there is any classification of mineral i.e. sand and gravel to determine their pricing; - Quarry extraction in mountainous areas need to operate in a careful manner to minimize impacts.
Lecturer	If public utilities are potentially impacted, prior management (i.e. relocation) prior to any works must be ensured to avoid service disruption.
Responses from the panel	<u>Responses from DNCPA</u> - Any entities will be penalized if rules are not followed. The DNCPA has created an inventory of private enterprises operating in Timor-Leste on the basis of which regulatory compliance will be regularly tracked. - There needs to be a system to ensure management of environmental impacts in planning documents. A template has been created which companies can follow. <u>Responses from the National Authority of Oil and Minerals</u> - There is differentiated pricing for mineral extraction depending on the purposes (i.e. public versus private); - The National Authority of Oil and Minerals works hand in hand with the Ministry of Environment. A prior survey will be undertaken (composed of a geologist and an environmental specialist) to inspect sites proposed for extraction; - On the basis of such an initial survey, pricing will be determined. <u>Responses from DRBFC</u> - It is crucial to ensure that the budget is sufficient for the whole operations; - In the event of relocation of public utilities such as electricity poles, contractors will be required to ensure proper management of such relocation to avoid/minimize potential service disruption, including approval from EDTL (state electricity company); - If there are grievances from the communities, the project needs to empower community leaders in resolving such grievances, prior to elevating them to the central governments.
Community representative from Ainaro	- Socialization on environmental laws has not fully reached rural areas; - There is observed weak implementation of mineral licensing laws

	and thus it is critical to promote transparency for the government to ensure that information on licensing is widely disseminated; Enabling communities to understand regulatory provisions should enable and empower them to participate in monitoring of project activities;
Veteran representative from Ermera	- Veteran associations need capacity building to participate in bidding processes; - Coffee farmers who may get affected due to loss of agricultural crops will need to be adequately compensated.
Coffee Cooperative	- The project will greatly assist coffee farmers to access the market in urban centers; - There is a need to further understand how the GoTL implement existing rules and regulations in rural areas; - The project needs to ensure quality design and construction in unstable soil conditions.
Letefoho community representative	Measures should be installed to avoid/minimize impacts around the Church premises in Letefoho.
Lecturer	- The project needs to ensure adequate protection to the environment, including agricultural plantations; - The project needs to collaborate with the University of Dili and Public Works on geological assessments.
Responses from the panel	<u>Responses from the National Authority of Oil and Minerals</u> - The law on mineral extraction was just passed in 2018 and hence socialization is yet to be completed. - All companies will need to pay retributions to the central government, not to community leaders <u>Responses from the Road PMU</u> - Workplace incidents, and community health safety risks tend to occur due to poor collaboration between communities and contractors <u>Responses from the DRBFC</u> - The project is expected to ensure participatory monitoring processes to enhance ownership and effective oversight, particularly processes involving affected communities and local governments

489. Coordination and consultations will continue throughout the pre-construction and construction phases as per- the communication procedures as outlined in the project's ESMP. Records including reports on environmental and social complaints and grievances will be kept in a simple database by the PMU and will be updated throughout the project implementation. If necessary, separate consultations and engagement with vulnerable groups will be included as part of the communication strategy by the PMU.

11.4 Information Disclosure

490. Information disclosure will be undertaken to address the requirements of the World Bank 4.01 on Environmental Assessment as well as OP 4.12 on Involuntary Resettlement. As part of the disclosure requirements for the project, the MPW through the PMU is responsible for (i) providing the SEIS/ESIA, ESMP and RAP to the World Bank and DNCPIA for review and clearance; (ii) once clearance has been obtained, disclosing these safeguards instruments in both English and Tetum through the MoPW's website, iii) ensuring that all environmental assessment documentation, including the CESMPs, and environmental due diligence and monitoring reports, are properly and systematically consulted and made publicly available to PAPs and the broader stakeholders; (iv) disclosing documentation of FGRM records and status of resolution

- and (v) providing information to the public and stakeholders about project implementation and status as per the Project's communication requirements.
491. Disclosure of relevant environment safeguards documents will be undertaken in an appropriate and accessible form, manner, and language and at an accessible location to the affected people and local stakeholders. The SEIS/ESIA, ESMP and RAP will be made available in both English and Tetum.
492. Where certain groups requires translation assistance, the Project will ensure that translators and translation of project-related materials will be available. This will be done in a manner to ensure full consultations with and disclosure to affected people, stakeholders, and communities regarding the requirements for environmental and social mitigation measures and monitoring.
493. The following safeguard documents to be prepared and submitted by the PMU shall be publically disclosed by GoTL. Once reviewed by the World Bank, the GoTL will authorize the World Bank to disclose them at the World Bank's website to meet transparency requirements:
- Draft and final SEIS/ESIA, ESMP and RAP;
 - New or updated environmental assessment reports to reflect significant changes in the project during design or implementation;
 - Corrective action plans prepared during project implementation to address emerging and/or unanticipated environmental and social impacts and agreed actions to rectify non-compliance as per-the ESMP and CESMP;
 - FGRM records and their status of resolution (to be updated monthly by the PMU) and;
 - Quarterly safeguards monitoring reports and other reports submitted by the PMU during project implementation (PISC will report monthly to PMU).

12. Difficulties Encountered

494. There were no particular difficulties encountered by the consulting team members in collecting data, conducting public consultations and compiling and analyzing information for the SEIS/ESIA, ESMP and RAP. However, due to the lack of laboratory services, there were constraints in performing an environmental assessment. For instance, while the Rural Water Sanitation Service (SAS) under the Ministry of Public Works is available to perform water quality analyses, its laboratory capacity is limited. Furthermore, the absence of ambient air baseline data has also prevented the team's ability to perform such analysis and make an accurate baseline for time-series impact assessments.
495. Several parts of Section 3 have been widened and the mission noted that there have been on-going construction works to improve the road conditions along this section under the GoTL's "Emergency Project" since 2018. The section is approximately 25.6 km, with an existing carriageway between 5 to 7 meters (5 – 7.5 meters of ROW). The scope of impacts and footprints of the GoTL's emergency project on land and assets remains changing since the construction has not been completed. Clear impacts associated with slope cutting and soil disposal on coffee plantations were observed during the site-visit. This on-going construction will present a technical challenge for a systematic tracer assessment since the scope E&S impacts will continue to change. However, an initial tracer has been conducted as part of the SEIS/ESIA to set a baseline for future references for impact assessments once the construction works have been completed. Such a tracer will therefore need to be validated prior to any construction works financed by the project in Section 3.

13. Conclusion and Recommendations

13.1 Findings and Conclusions

496. The road improvement Project ± 60 km of Branch Road Section Aituto – Hatubuilico – Letefoho – Gleno, offers a robust option for the enhancement of the existing road networks. The improvement works are restricted to the existing road corridor with few realignments to reduce the sharp curves for safety reasons. Land acquisition and asset removal will be required for the widening of the existing carriageway prior to construction. A LARAP has been prepared to establish policies and procedures for payment of compensation to the Project Affected People (PAP) for any loss of assets as well as temporary livelihoods support to address OP 4.12 requirements.
497. The existing footprints consist of rural roads which traverse elevated areas that were considered as protected areas due to the topography and geological conditions, as well as an important bird area. However, the SEIS/ESIA confirmed that there are no longer primary forest areas along the project footprints that pass the protected area, as well the presence of threatened birds as per- the IUCN's list. Furthermore, the Project will not create any impacts on cultural or heritage sites since the DED has incorporated measures or adjusted proposed alignments to avoid these areas. Impacts with regards to land acquisition and resettlement have also been minimized through engineering measures and will be presented separately in the DED. Based on the public consultations, all Suco communities endorsed the project provided that consultations and mitigation measures, including compensations are implemented based on mutual consensus.
498. Potential impacts generated and/or associated with the Branch Road Project construction are likely predictable and manageable with appropriate mitigation measures. Adequate human and financial resources within the PMU and selected contractors will be instrumental to address key provisions in the ESMP and address emerging risks during the project implementation. Technical support is also likely needed to ensure that environmental permitting processes are based on adequate assessments proportionate to the risks and delivered in a timely fashion. Similarly, such support is also likely needed for the implementation of the LARAP, where the role of the National Directorate of Cadastre under the Ministry of Justice and Social Solidarity will be increasingly more prominent due to the extent of private land parcels affected compared to the previous road projects in the country.
499. The Environmental and Social Management Plan (ESMP) responds to the types, extent, cycle and duration of the project activities and is proportionate to the identified environmental and social impacts. Implementation of appropriate measures as defined in the ESMP during the design, construction, and operation phases is expected to minimize negative impacts and bring emerging impacts to acceptable levels. To ensure that mitigation measures are adequately implemented and legally binding, inclusion of relevant environmental and social mitigation requirements will need to be incorporated in the construction bidding documents and monitored by PISC throughout project implementation.
500. In terms of social impact, the construction of Branch Road Section Aituto – Hatubuilico – Letefoho – Gleno, has the potential, in following up with Government commitment, to increase women participation in employment. The risks as they relate to gender-based violence, represented mostly in the Timorese context by sexual harassment in the workplace and sexual exploitation and abuse, can be effectively mitigated if the necessary steps are taken, considering measures for the prevention of gender-based violence, including through capacity development and awareness raising, and for the protection of survivors, mostly through, an efficient internal accountability system, close communication with the community and support to access social support services.
501. Contractors' conformity and obedience with agreed contract procedures and specifications and implementation of the approved CESMP during construction will be

carefully monitored. The Contractor will be required to follow standard construction practices and comply with a series of contractual requirements which will be monitored and supervised by PMU and PISC. Environmental and social monitoring of the project will be undertaken regularly through the first three years of its operation to ensure that the measures are being implemented properly. This will be followed by a review to understand whether the processes are still relevant, and the proposed capacities are adequate to address risks emerging during the project implementation.

502. The proposed Project is overall expected to generate positive impacts such as improving community access to district centers and public services (i.e. health and education facilities, markets) as well as enabling safer and efficient travels. In addition, the project is expected to boost local economic growth through interconnectivity for trades and tourism. Community health aspects are also expected to be enhanced through cleaner roads, reduced dusts and disaster risks such as landslides. Potential adverse impacts are evinsaged as will have less significant negative impacts that will nevertheless be carefully monitored and adequately mitigated. A major benefit of the proposed Project is the accessibility to the social services being provided.
503. The overall conclusion is that the proposed Project complies with environmental categorization B, and therefore the completion of this SEIS fully meets GoTL. The project category based on OP 4.01 Environmental Assessment will be subject to World Bank's appraisal.

13.2 Recommendations

504. The recommendations of this SEIS/ESIA are: (i) the SEIS/ESIA can be accepted by World Bank and DNCPIA as the statement of project's environmental impacts and how they will be mitigated; (ii) Contractor to prepare a CEMP based on the pre-construction and construction parts of the ESMP included in this SEIS detailing their specific construction methodologies and submit to PMU for review and approval; and, (iii) the project impacts and implementation of mitigation measures, be monitored as per the monitoring plan in the Environmental and Social Management Plan.

NOTE:

All the application processes for securing the licenses for quarry activity and its associated facilities to support the road project implementation must follow the requirements under the Law.

14. Non-Technical Summary

No	ENGLISH	TETUM
1	Introduction: The Government of Timor-Leste (GoTL) will upgrade and support climate resilience of 110 kilometers (km) Dili – Ainaro Road which serves as a key link between the north and the south of the country. The Project's objective is to improve and upgrade of the road network of Timor-Leste between municipality and town. The improvement will be designed and implemented by the Ministry of Public Works, while the entire of the project will be financed by the World Bank. This SEIS report covers about 60 km length of the Aituto – Hatubuilico – Letefoho – Gleno. Detailed design for the Branch Road Project is being prepared, and will be completed by (i) pavement reconstruction with selective widening if required; (ii) improvement of drainage structures to meet forecasted rainfall volumes and intensities; (iii) clearing and improvement of culverts; (iv) construction of reinforcement of slope stabilization structures; and v) introducing road marking and signage and other measures to improve road safety. The Project Management Unit (PMU) within MPW will manage and implement the project as it is financed by one of GoTL's development partners including implementation of environmental safeguards, mitigation measures, and other requirements.	Introdusaun: sei atualiza no apoiu ba alterasaun klimátika reziliénsia kilométru 110 (km) Estrada Dili – Ainaro ne ' ebé serve hanesan ligasaun xave ida entre parte norte no súl país nian. Projetu ne'e nia objetivu mak atu hadi'a no atualiza rede estrada nian iha Timor-Leste entre distritu no sidade nian. Dezeña no implementa hadia estrada hosi Ministériu Obras Públikas, enkuantu projetu ne'e sei Financia hosi Banku Mundiál. Relatóriu SEIS (Deklarasaun Impaktu Ambiente Simplifikadu) ida ne'e kobre estrada nia naruk kilomentru 60 (km) hahu hosi estrada seksaun Aituto – Hatubuiliku – Letefoho – Gleno. Dezeñu detalladu kona ba Projetu Estrada agora daudaun prepara hela, no sei kompleta: (i) rekonstrusaun seletivu hadi'a no haluan estrada se presiza; (ii) hadi'a estrutura drenajen atu akumula volume bé iha tempu udan ne ' ebé prêve ona; (iii) no hadi'a ka hamos bé dalan / manila; (iv) konstrusaun barazen hodi estabilizasaun estrutura rai lolon; no v) introdús markasaun sinais estrada no medida sira seluk hodi hadi'a seguransa estrada. Unidade Jestaun Projetu (PMU) iha Timor-Leste nian sei jere no implementa projetu ida ne'e hanesan ida ne'e finansia husi parseiru dezenvolvimentu GoTL nian inklui implementasaun ba medida proteasaun ambientál, medidas mitigasaun no rekizitu sira seluk.
2	The Proponent is the Government of Timor-Leste (GoTL) and the Implementing Agency is the Ministry of Public Works (MPW).	Proponente maka Governo Timor Leste (GoTL) no implementa hosi Ministériu Obras Públikas (MOP).
3	The EIA Environmental Consultants who completed the SEIS are identified.	Konsultór EIA ambientál ne'ebé kompleta DIAS ne 'e identifika tiha ona.
4	Project Description: The Project will improve and rehabilitate ± 60 km of the road section Aituto – Hatubuilico – Letefoho – Gleno by improvement to National Road Standard following international best practices and quality standards and providing one wider traffic lane per direction, with sidewalks in villages and improved bridges. Drainage will also be cleaned and improved, curves will be added, and new road markings and signs will improve road safety.	Deskrisaun Projetu: Projetu Ne'e sei hadi'a no reabilita ± 60 Km estrada seksaun Aituto – Hatubuiliku – Letefoho – Gleno hodi hadi'a Estrada Padraun Nasional tuir prátika internasionál ne ' ebé di'ak liu no padraun kualidade no fornese tráfikua ida ne ' ebé luan liu ba dalan kada direasaun, ho sidewalks (<i>Trotoar</i>) iha aldeia no ponte sira ne ' ebé di'ak liu. Drenajen sei mós no hadi'a diak liu tan, sei loke luan strada kurva, marka liña dalan foun no sei hadi'a sinál seguransa estrada.
5	Legal framework: The implementation of the Project governed by laws, regulations, and standards for environmental protection and management of GoTL including the Basic Law of Environment and the Decree-Law 5/11 on Environmental Licensing as well as Labour Laws.	Kuadru Legal: implementasaun ba Projetu ne ' ebé regula husi lei, regulamentu no padraun sira ba proteasaun ambientál no jestaun ba GoTL ne ' ebé inklui iha Dekretu Lei 5/11 kona-ba Lisensiamentu Ambientál no Lei Báziku Ambiente.

No	ENGLISH	TETUM
	In addition to GoTL requirements, the Branch Road Project must comply with the World Bank's Guidelines for Environmental and Social Considerations. According to both Timorese law and the World Bank's Guidelines, the Project may be classified as Category B because the potential adverse environmental impacts are site-specific and mitigation measures can be designed readily.	Aleinde rekizitu GoTL, Projetu Estrada seksaun tenke konsidera no kumpri Banku Mundial nia Diretrizes Ambiental no Sosial. Tuir lei Timor-Leste tantu lei Banku Mundiál nia Matadalan, Projetu ne'e bele klasifika hanesan Categoria B tanba iha potensial ambiental impaktu ladiak sira konaba no medidas mitigasaun bele sai dezeña pruntu.
6	Description of Environment: The environmental setting for the Project in terms of the surrounding physical and biological features is described including social and economic conditions, livelihoods and quality of life.	Deskrisaun Ambiental: Lalaok ambiente ba Projetu iha termus karakterizasaun fiziku no biolojiku deskrebe ona inklui kondisões sosiál no ekonomiku, qualidade da vida no rendimentu lor-loron.
7	Alternatives: The proposed Road improvement includes the “without Project” alternative alignments and alternative transport modes assessment. The viable alternative is a road with improvement and enhancement of the parts of the existing route (the 3 rd alternative). This route will contribute to the economic and social development of the communities near the existing road corridor.	Alternativas: Hadi'a Estrada propoin inklui mós "la iha Projetu" alternativu aliñamentu, no avaliasaun modu transporte alternativu. Luta ba alternativu mak dalan ida ho hadi'a no valorizasaun parte rute eziste (alternativa 3 sira). Dalan ida-ne'e sei kontribui ba dezentvolvimentu ekonómiku no sosiál ba comunidade sira besik koridor dalan eziste.
8	Climate change: The impacts of relevant climate change predictions and considerations for Timor Leste and relevant adaptation measures and considerations for the Project are discussed.	Mudansa klimatikas: Impaktus relevante husi predisões no konsiderasões ba mudansa klimatika ba Timor Leste ho medida adaptasaun ne'be relevante no konsidera ba Projeto diskuti ona.
9	Environmental impacts: short-term and long-term impacts are reviewed from the pre-construction through the construction phase, and to the operational phase with corresponding mitigation measures.	Impaktus ambientál: impaktu kurtu-prazu no prazu naruk revizaun sira husi pré-konstrusaun liu husi faze konstrusaun nian, no mós ba faze operasionál ho medidas mitigasaun korrespondente.
10	Environmental and Social Management Plan: The Project environmental impacts will be controlled by making the Contractor provide mitigation measures to minimize environmental impacts to acceptable levels. Controls on construction impacts such as dust and noise, waste disposal, water quality impacts, health and safety concerns, tree felling, traffic interruption, preservation of water and electricity supplies will be monitored on a regular basis by the PMU. Training will be provided as necessary to ensure these impacts are mitigated to the greatest extent feasible. Social management plan will include provision of improved complaint systems and strengthening of accountability mechanisms, as well as provision of training and awareness raising to support increased knowledge and attitudes in relation to gender-based violence.	Planu de Jestaun Ambiental: Impaktus ambientalhusi Projetu sei kontrola ho halo Kontraktor fornese medidas mitigasaun hodi minimiza impaktus ambiental to'o nivel ne'ebe aceitavel. Kontrola ba impaktus konstrusaun hanesan rai rahun no baruilhu, soe lixu, impaktus ba qualidade be'e, intereses saude no seguransa, tesi ai, interupsaun trafiku, prezervasaun be'e no fornese eletricidade mos sei monitoriza regularmente husi PMU. Treinamentu sei fornese necessariu atu garante impaktus hirak ne'e mitigadu tuir dalan ne'ebe diak liu. Jestaun sosiál sei inklui haforsa sistema kesar no hametin mekanizmu responsabolizsaun, no mós implementa formasaun no sosializsaun atu hasa'e koñesimentu no konxiénsia kona-ba violénsia bazeia ba jéneru.

11	Public consultations were undertaken during the preparation of this SEIS to give information on the scale and scope of the Project to interested parties including the general public and authorities; covering the expected impacts and the proposed mitigation measures. Information was gathered on concerns of the local community to be included in the project implementation stages. Project documentation will be disclosed in a place and language accessible to stakeholders.	Konsultasaun publikus hala’o ona durante preparasaun ba DIAS ida ne’e hodi fo informasaun konaba eskala no eskopu projetu nian ba partes interesadas hotu inklui publiku jerais no autoridades; kobre espektasaun impaktus no proposta medidas mitigasaun. Informasaun ne’ebe hetan iha interese atu inklui comunidade local iha faze implementasaun projetu. Dokumentasaun projetu sei divulga iha fatin ho linguajen acessivel ba partes interessadas.
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No	ENGLISH	TETUM
12	Difficulties were not particularly encountered; however, few limitations are described such as laboratory capability is limited, the absence of ambient air baseline data and the presence of threatened birds on the IUCN list.	Difikuldades sira ne'ebe la-dun boot; maski nune'e, limitasaun hirak ne'e deskreve hanesan kapasidade laboratóriu sai limitadu, la iha baze dadus anin ou <i>ambien</i> no la prezensa manu fuik sira ne'be kategoria ameadu atu mohu tuir lista IUCN.
13	Conclusion and Recommendations: The Project road should have beneficial effects on the surrounding environment; overall with shorter traveling distance, more efficient travel and improved traffic flow, improve access as well as tourism. The smoother asphalt surface will reduce noise and the accumulation of roadside dust and therefore air pollution from the noise and disturbed dust should also be reduced and improved road gutters will improve drainage. The Project construction is restricted to areas within the road corridor and only several lands required for re-alignment and for curve improvement. The impacts from construction and operation will be manageable and no insurmountable impacts are predicted, provided that the mitigation measures are implemented thoroughly. The overall recommendation of this SEIS are that: (i) the SEIS be accepted by World Bank and DNCPIA as the statement of the project's environmental effects and how they will be mitigated; (ii) Contractor to prepare a CEMP based on the pre-construction and construction parts of the EMP included in this SEIS detailing their specific construction methodologies and submit to PMU for review and approval; and, (iii) the project impacts and implementation of mitigation measures, be monitored as per the monitoring plan in the Environmental and Social Management Plan.	Konkluzoens no Rekomendasoens: Dalan Projetu bele iha efeitu di'ak kona-ba ambiente viajen ne ' ebé, besik, efisiente liu ba movimentu tráfiku ho di'ak liu, aumenta asesu no mos ba turizmu ne ' ebé di'ak. Estrada ho aspal ne'ebe mak kabers hamenus barullu no rai-rahun ne'ebe maka konsentra iha estrada ninin tamba ida ne mak polusaun anin no barullu hosi rai rahun iha strada nini tenki hadi'a valetas no drenajen Konstrusaun Projetu ne'e restrisaun ba área sira ne ' ebé iha koridor dalan de'it. Rai/fatin balun mos presiza ba re-alinamentu no atu hadi'a kurva. Impaktu husi konstrusaun no operasaun sei manageable no laiha impaktu insuperavel, naran katak medida mitigasaun sira implementa kle'an no lolos. Rekomendasaun sira kona-ba SEIS mak hanesan tuir mai ne'e: (i) SEIS sei simu husi Banku Mundial no DNCPIA hanesan deklarasaun kona-ba projetu sira-nia efeitu ambiental no oinsá mak sira bele hamenus; (ii) kontraente sira atu prepara CEMP ida ne ' ebé bazeia ba pré-konstrusaun no konstrusaun EMP ne ' ebé inklui iha SEIS ida ne ' ebé fó sira-nia metodolojia konstrusaun ne ' ebé espesífiku no apresenta ba PMU hodi halo revizaun no aprovasaun; no impaktu hosi projetu no implementasaun medida mitigasaun bele monitoriza hanesan planu monitorizasaun iha Planu Jestaun Ambiental no Sosiál.

APPENDICES

Appendix 1–Selected Photos

	
Section 1: Aituto – Hatubuilico	Section 1: Aituto – Hatubuilico
	
Section 2: Hatubuilico – Letefoho	Section 2: Hatubuilico – Letefoho
	
Section 3: Letefoho – Gleno	Section 3: Letefoho – Gleno

APPENDICES

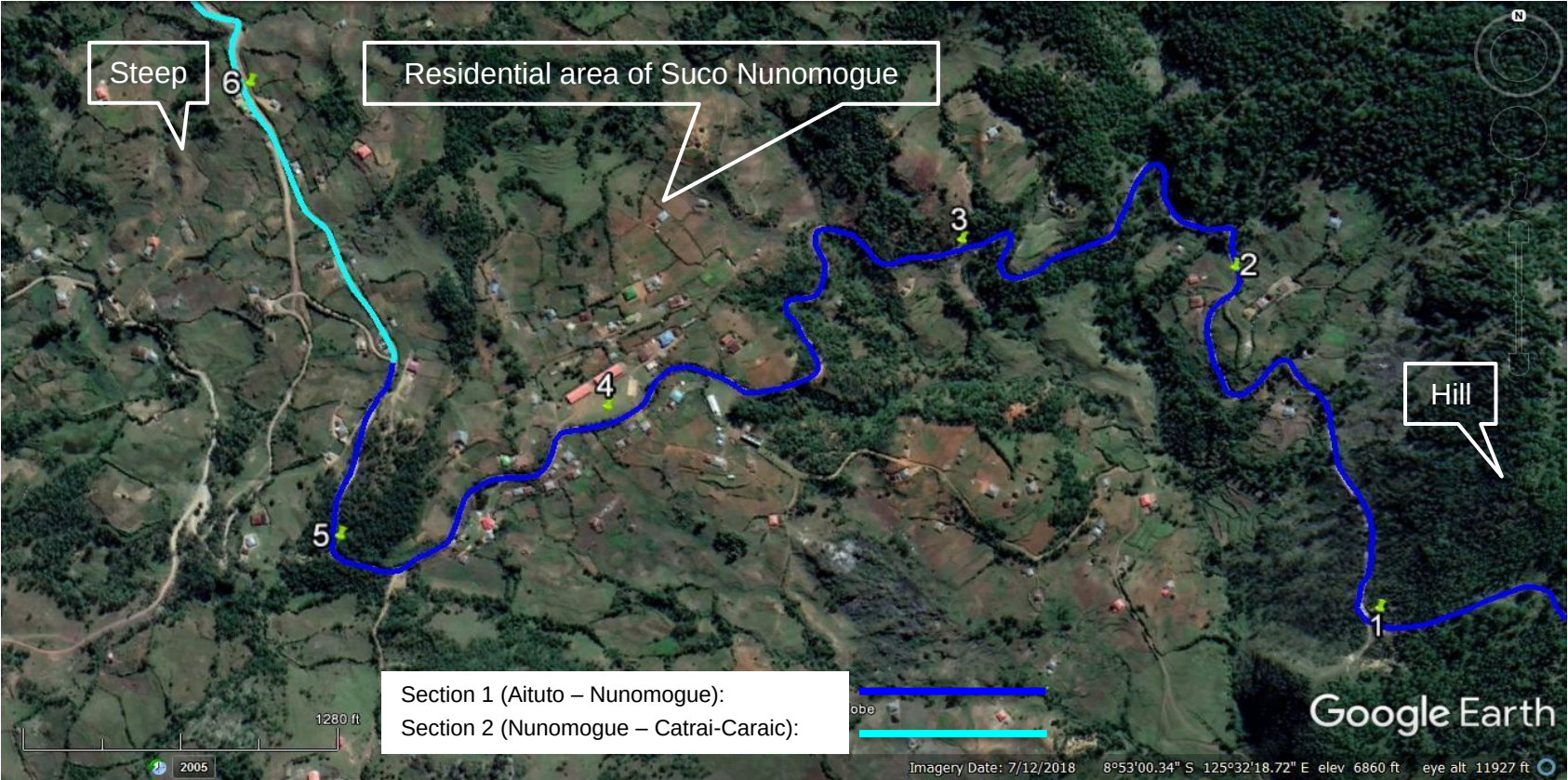
Appendix 2 – Important Bird Areas (IBAs) and the Protected Areas in Ainaro Municipality

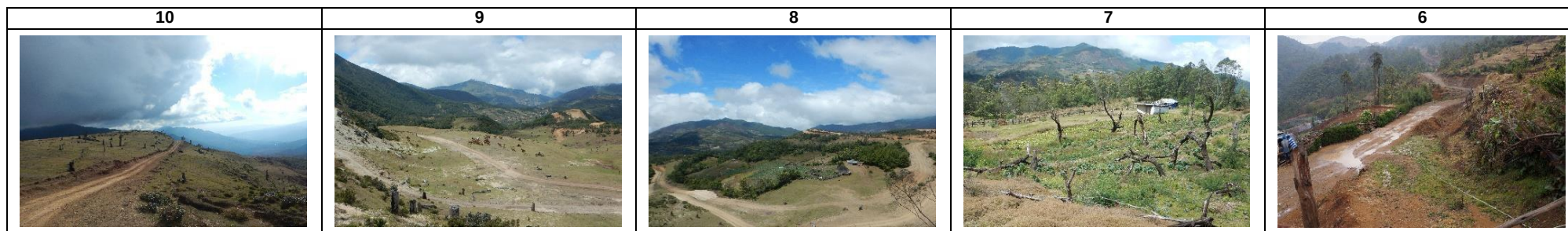
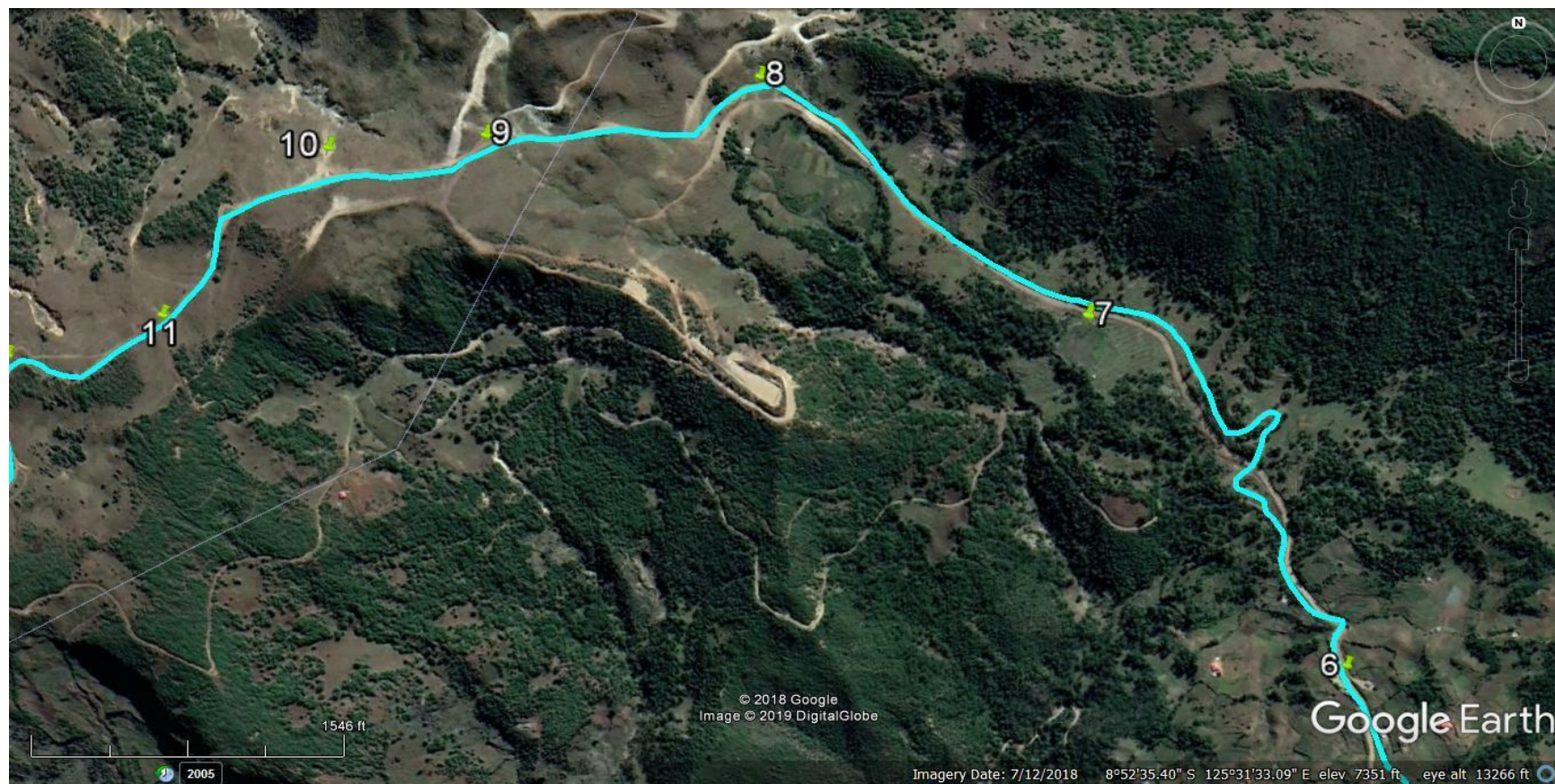
IBA code	IBA Name
TL 01	Tilomar
TL 02	Tata Mailau (Ramelau)
TL 03	Fatumasin
TL 04	Atauro Island – Manucoco
TL 05	Clere river
TL 06	Lore
TL 07	Mount Paitchau and Lake Iralalaro
TL 08	Jaco Island
TL 09	Mount Diatuto
TL 10	Be Malae – Atabae
TL 11	Maubara
TL 12	Mount Mak Fahik and Mount Sarim
TL 13	Tasitolu
TL 14	Areia Branca ("Cristo Rei") Beach and hinterland
TL 15	Mount Curi
TL 16	Irabere Estuary and Iliomar Forest
Potential IBAs	Saboria Mountain (above 2,000 m)
Potential IBAs	Talobu/Laumeta Mountain (above 2,000 m)
Potential IBAs	Mount Mundo Perdido (threatened and restricted-range birds)
Potential IBAs	Mount Matebian (above 2,000 m)
Potential IBAs	Mount Cablaque (limited closed canopy forest and up to 20 Yellow-crested Cockatoo <i>Cacatua sulphurea</i> were observed)

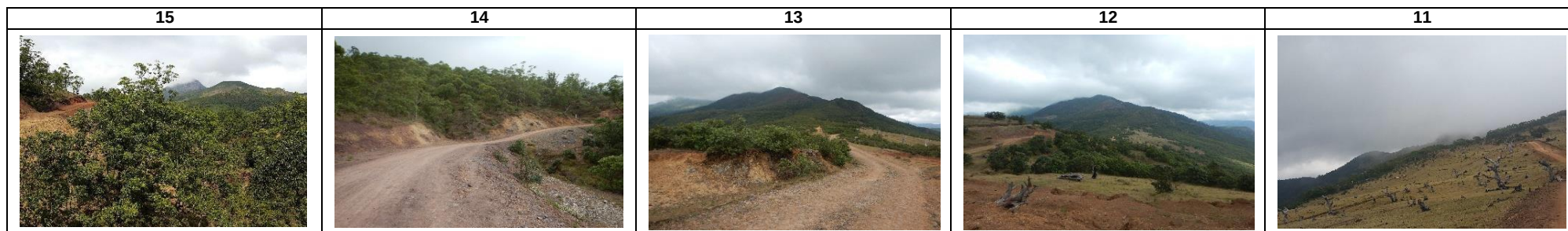
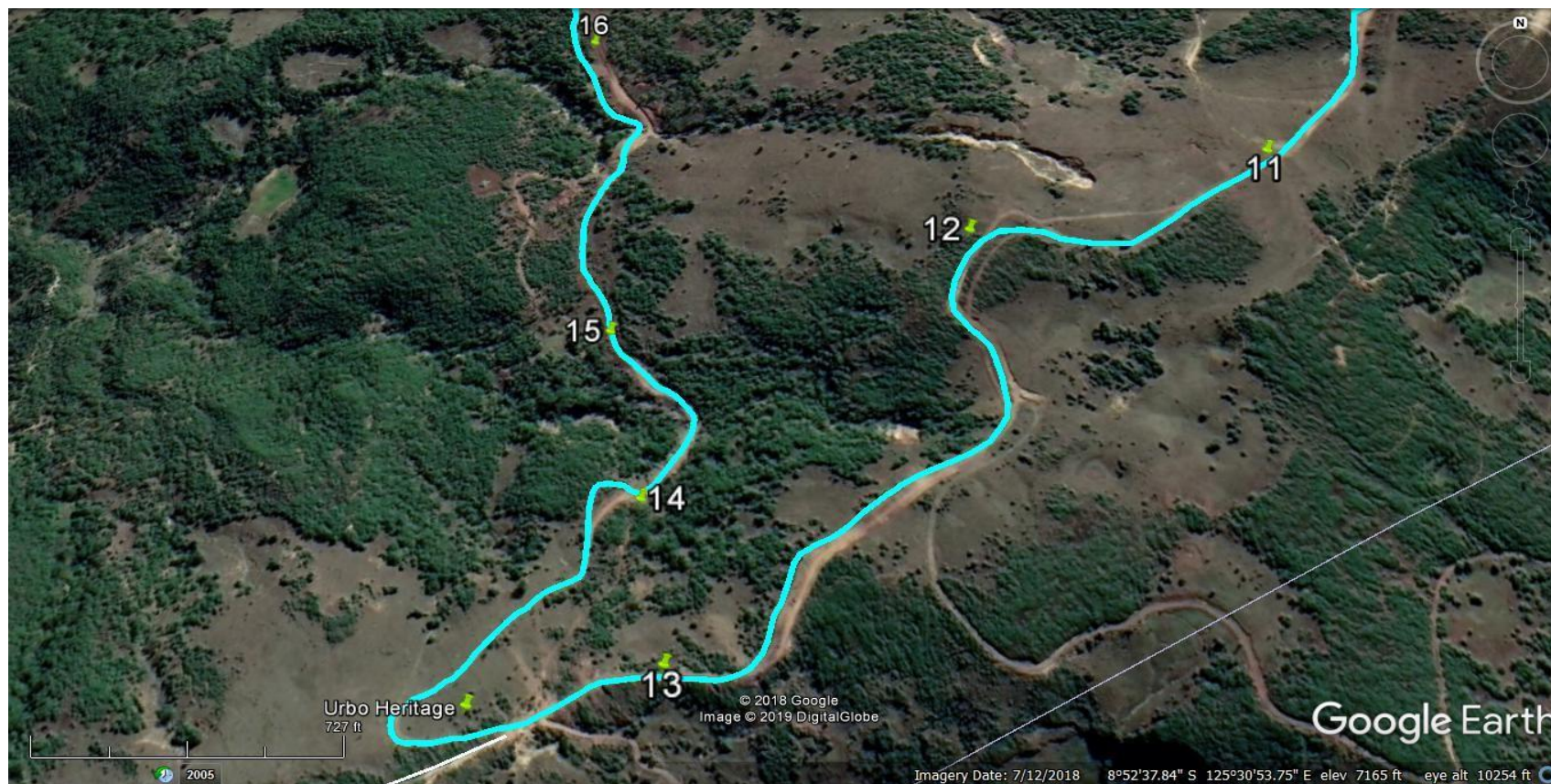
Source: Important Bird Areas in Timor-Leste (BirdLife International, 2007)

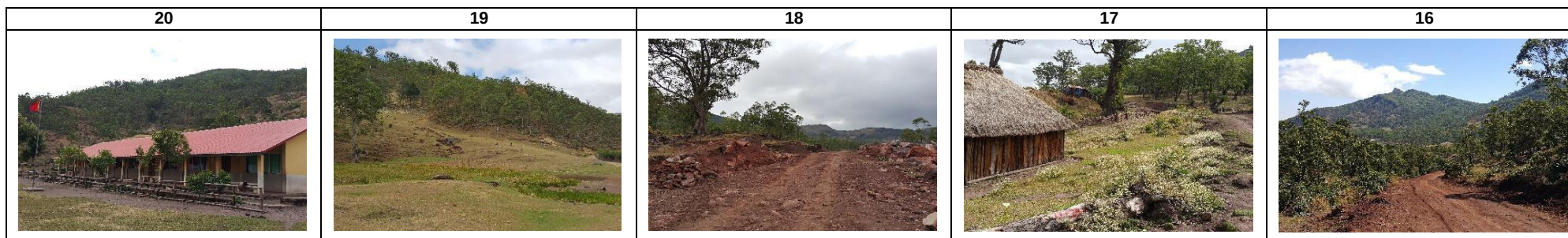
Protected Area	Municipality	Administrative Post	Village	Estimation Surface (Ha)
Mount Tatamailau/ Ramelau	Ainaro	Hatubuilico	Nunomogue	20.000
		Ainaro	Manutasi	
	Ermera	Letefoho	Bobo Leten	
			Catrai-Craic	
		Atsabe	Malabe	

Source: DL No. 5/2016, SNAP









APPENDICES

Appendix 3 – Affected Trees

AFFECTED TREES IN SECTION 1					
No.	STA	Small (150 mm – 900 mm)		Large (> 900 mm)	
		Left Side	Righ Side	Left side	Righ side
1	0 + 000 – 0 + 120		5		
2	0 + 100 – 0 + 250	25			
3	0 + 660	1			
4	0 + 820	1	1		
5	0 + 880		2		
6	0 + 950	1			
7	1 + 080		2		
8	1 + 660 – 1 + 720		6		
9	1 + 860 – 1 + 900		1		2
10	2 + 060				1
11	2 + 120 – 2 + 480		56		4
12	2 + 540 – 3 + 140		112		
13	3 + 160	1			
14	3 + 160 – 3 + 340	3	15		
15	3 + 340 – 3 + 900		100		
16	3 + 900 – 3 + 930	4			
17	3 + 930 – 4 + 500	5	66		
18	4 + 660 – 4 + 820	3	34		
19	5 + 060 – 5 + 140	2		1	
20	5 + 240 – 5 + 600	45			
21	5 + 700 – 5 + 780		3		
22	5 + 780			1	
23	5 + 860 – 6 + 260		28		5
24	6 + 540 – 6 + 620		3		1
25	7 + 560 – 7 + 680		28		2
26	7 + 860 – 7 + 940		20		
27	7 + 940	4		1	
28	7 + 960 – 9 + 080		140		4
29	9 + 140 – 9 + 460		17		2
30	9 + 650	3		1	
31	9 + 660 – 10 + 600		36		2
32	10 + 700 – 10 + 960		37		2
33	10 + 940 – 10 + 960	6			
34	11 + 100 – 11 + 400		16		
Total		104	728	4	25
Summary		Small trees: 832		Large trees: 29	
		Total affected trees in Section 1 = 861 trees			

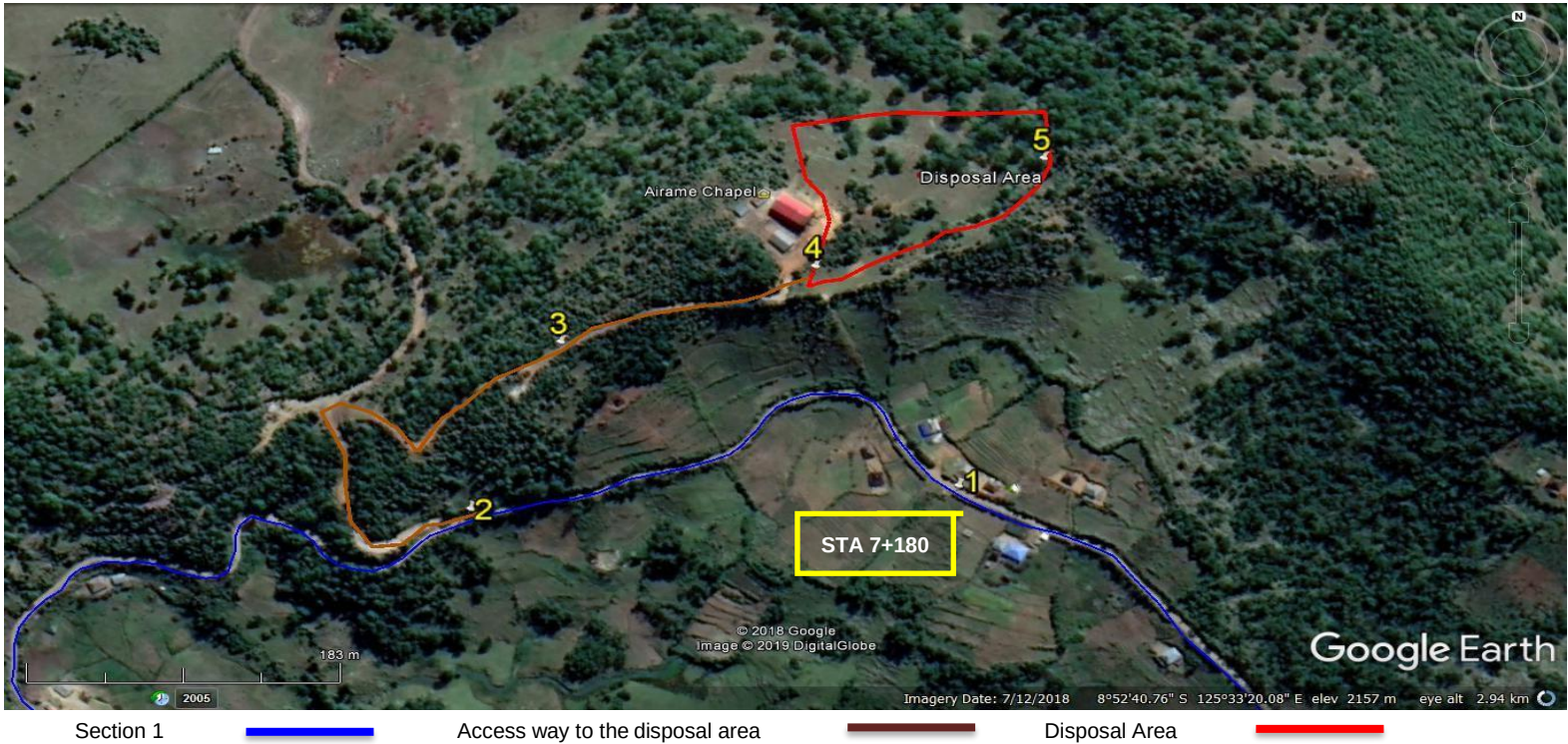
AFFECTED TREES IN SECTION 2					
No.	STA	Small (150 mm – 900 mm)		Large (> 900 mm)	
		Left Side	Righ Side	Left side	Righ side
1	12 + 120 – 12 + 320		20		
2	15 + 600 – 15 + 960	13			
3	16 + 300 – 16 + 700		5		
4	17 + 200 – 17 + 240		4		
5	17 + 460 – 17 + 820		8		
6	18 + 420 – 18 + 700	34	5		
7	18 + 900 – 20 + 020		42	1	6
8	21 + 140 – 20 + 380		31		8
9	21 + 300 – 21 + 400	4	4		
10	21 + 620 – 21 + 780		5		
11	21 + 800 – 22 + 100	7			
12	22 + 100 – 22 + 220		7		
13	22 + 220 – 22 + 840	21	1		
14	22 + 940 – 14 + 340	2	36	4	
15	24 + 480 – 26 + 640	1	2		
16	25 + 820 – 26 + 260	41	4		
17	26 + 520 – 26 + 800	12	2		
18	28 + 880 – 27 + 060	13			
19	27 + 160 – 28 + 000	14		11	
20	28 + 200 – 28 + 400	22	1		
21	28 + 480 – 29 + 220	42			
22	29 + 300 – 29 + 380		3		
Total		226	180	16	14
SUMMARY		Small trees: 406		Large trees: 30	
		Total affected trees in Section 2 = 436 trees			

TREES AFFECTED IN SECTION 3					
No.	STA	Small (150 mm – 900 mm)		Large (> 900 mm)	
		Left Side	Righ Side	Left side	Righ side
1	38 + 840 - 39 + 200	12	10	3	
2	39 + 300 - 40 + 800	36	15	3	7
3	40 + 900 - 41 + 900	32	17	3	4
4	42 + 300 - 43 + 500	19	24		11
5	48 + 460 - 49 + 200	11	38	7	7
6	49 + 300 - 50 + 000		67		11
7	50 + 060 - 51 + 080	19	57		3
8	51 + 340 - 52 + 780	12	52	9	14
9	52 + 900 - 54 + 280	18	57	5	11
Total		159	337	30	68
SUMMARY		Small trees: 496		Large trees : 98	
		Total affected trees in Section 3 = 594 trees			

Source: Primary data, 2019.

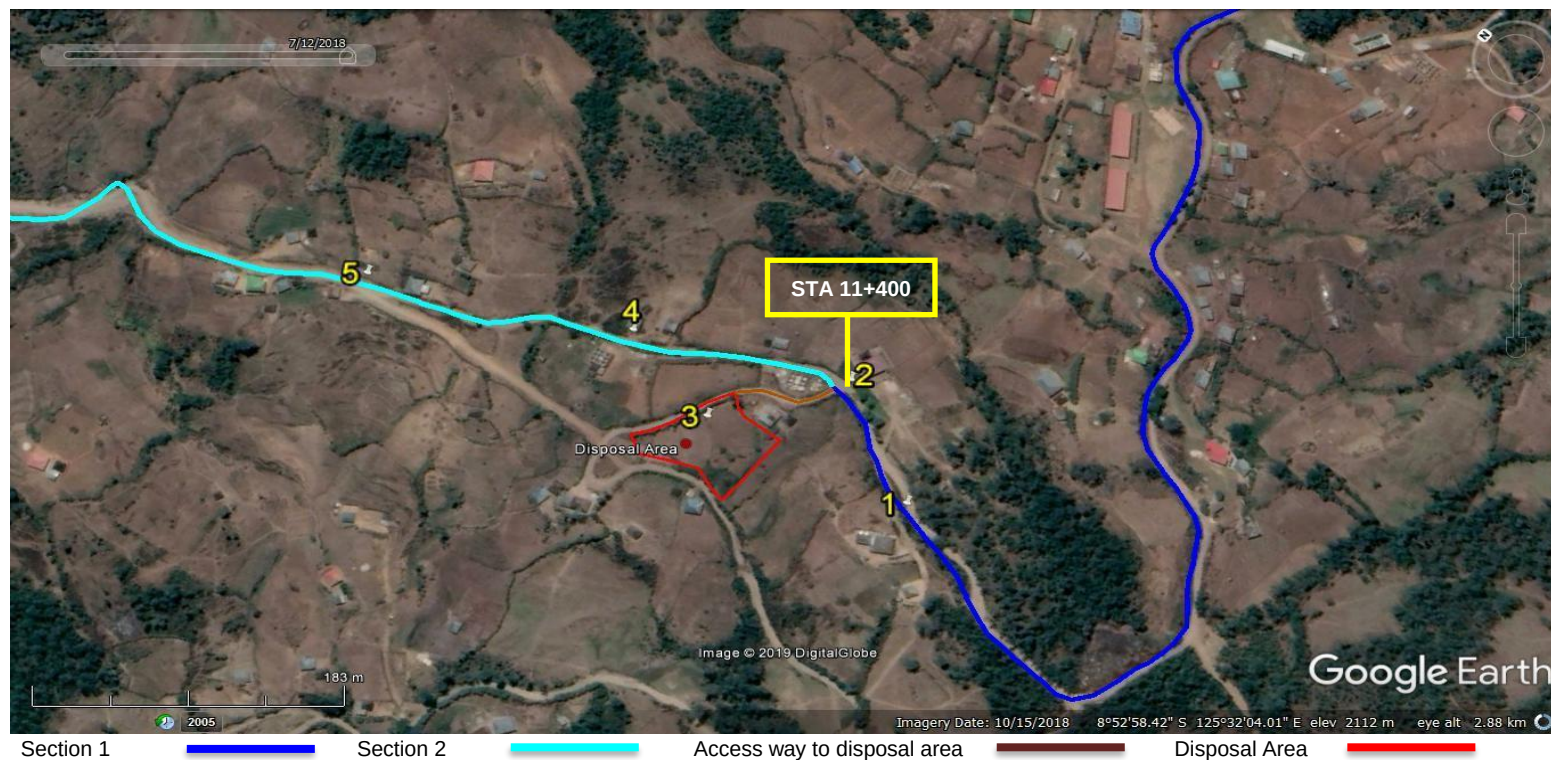
APPENDICES

Appendix 4 – Potential Disposal Areas and Stockpile Area

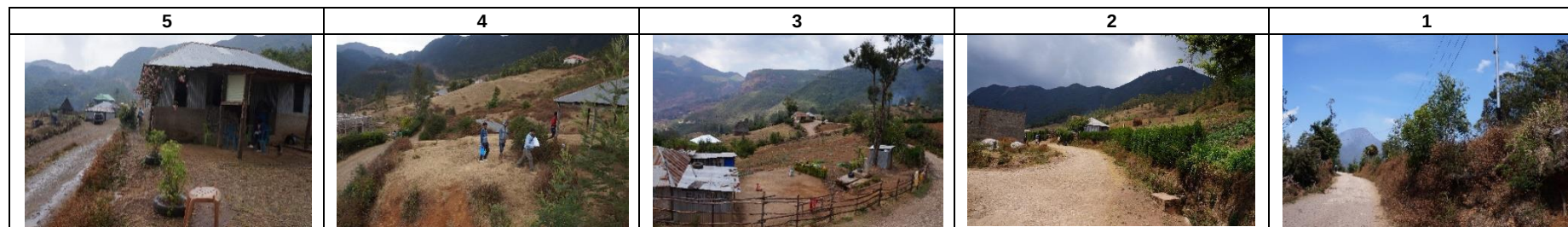


Note: Distance of road project to the disposal area = 350 meters; and estimation of the total area of spoil disposal = ± 12,712 m²





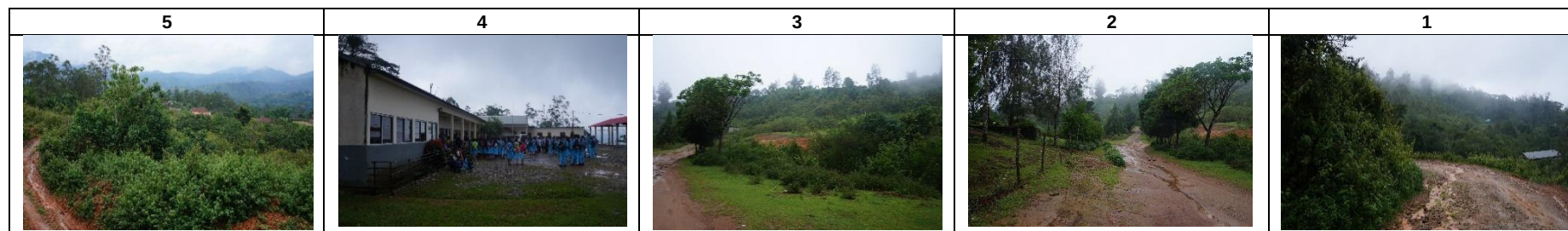
Note: Distance of road project to the disposal area = 30 meters; and estimation of the total area of spoil disposal = $\pm 3,213 \text{ m}^2$





Section 1  Section 2  Section 3  Access way to disposal area  Disposal Area 

Note: Distance of the disposal area from Letefoho junction = 750 meters; and estimation of the total area of spoil disposal no. 3 is $\pm 4,369 \text{ m}^2$; and no. 5 is $\pm 11,567 \text{ m}^2$





Section 3 Access way to disposal area Disposal Area

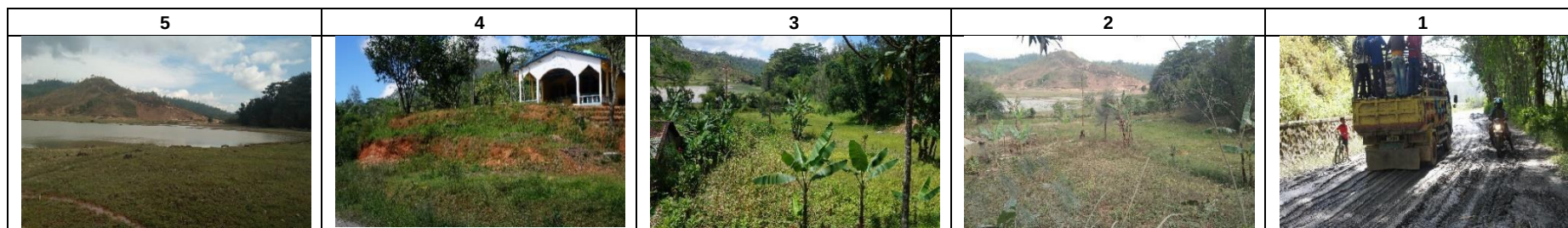
Note: Distance of the disposal area from main road = 50 meters; and total area of spoil disposal ± 5,329.4 m²

5	4	3	2	1



Section 3 Disposal Area

Note: Distance of the disposal area from main road = 5 meters; and total area of spoil disposal $\pm 3,387 \text{ m}^2$





Section 3 Stockpile Area

Stockpile area ± 13,290 m²



APPENDICES

Appendix 5 – Public Consultation Meeting Summary

5.1. Public Consultation – Attendance List

5.2. Public Consultation – Photography

5.3. Public Consultation – Baseline Data Questionnaire

5.1. Attendance List

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO HORAI QUIK SUB-VILLAGE LAUHELI BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATUBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 12 th , 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Luis Casmiro Lopes	Male	Administrator of Maubisse administrative post	Maubisse
2	Alcino P. D. Jesus Tilman	Male	Suco Chief	Horaiquik
3	Duarte Benevides	Male	Chief of sub-village	Horaiquik
4	Domingus	Male	Community	Aileulala
5	Amelia Basa	Female	Community	Aileulala
6	Francisco de Araujo	Male	Community	Manuradi, Lauheli
7	Duarte Benevides	Male	KPK	Kartolo
8	Julio R. de Araujo	Male	KPK	Horaiquik/Cartolo
9	Agusto da C. Silva	Male	Duel Kudo	Gounema
10	Lucas	Male	Community	Lauheli
11	Jacinto Pereira	Male	Community	Liurai
12	David Mendonca	Male	Community	Aileulalan
13	Martinho de Araujo	Male	Community	Horaiquik
14	Baptista	Male	Community	Horaiquik
15	Claudio Mendonca	Male	Community	Horaiquik
16	Duarte Benevides	Male	Chief of Cartolo sub-village	Horaiquik
17	Armino Oliveira	Male	Chief of Batucao sub-village	Horaiquik
18	Marcelino da C. Pires	Male	Secretary of Horai Quik Suco Chief	Horaiquik
19	Lucio da C.	Male	Security	Horaiquik
20	Alberto da Silva	Male	Community	Lauheli
21	Alcino da Silva	Male	Community (Youth)	Aihou
22	Ximião	Male	Community (Youth)	Aihou
23	Domingos da C. Tilman	Male	Community (Youth)	Aihou
24	Simão	Male	Community (Youth)	Aihou
25	Natalia Marques	Female	Assistant of the sub-village Chief	Cartolu
26	Florencia de Jesus	Female	Community	Lauheli
27	Feliciano Mendonça	Female	Community	Lauheli
28	Joel de Deus	Male	Community	Lauheli
29	João Almeida	Male	Elder/Traditional Leader	Lauheli

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO MULO SUB-VILLAGE OF MAULAHULO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 13 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Jose Andrade	Male	Suco Chief	Aituto
2	Antonio M. Oliveira	Male	Chief of sub-village	Maulahulo
3	Armando de A.	Male	Administrator of Hatobuilico municipality post	Hatobuilico
4	Raul Amaral da C.	Male	PNTL (Polisia Nasional de Timor Leste)	Hatobuilico
5	Carlito de Araujo	Male	EDTL Representative	Hatobuilico
6	Domingos Lopes	Male	Staff of Administrator	Hatobuilico
7	Agusto Mendonça	Male	Community	Maulahulo
8	Gerónimo Pereira	Male	Community	Maulahulo
9	Jacinto da C.	Male	Community	Maulahulo
10	Agostinho Sampaio	Male	Community	Maulahulo
11	Santiago X.	Male	Staff of PNDS	Maulahulo
12	Joao da Conceicao	Male	Community	Maulahulo
13	Antonio M. Oliveira	Male	Chief of sub-village	Maulahulo
14	Alexandrino S.	Male	Community	Maulahulo
15	Amaro da Cruz	Male	Community	Maulahulo
16	Ernesto Sampaio	Male	Assistant of Chief of sub village	Maulahulo
17	Octavio M. Oliveira	Male	Delegado	Maulahulo
18	Calistro de Deus	Male	Community	Maulahulo
19	Domingos Cardoso	Male	Community	Maulahulo
20	Manuel X. Verdial	Male	Community	Maulahulo
21	Abilio Alves	Male	Community	Maulahulo
22	Orlando Baptista	Male	Community	Maulahulo
23	Luis Cortereal	Male	Community	Maulahulo
24	Luis da Costa	Male	Community	Maulahulo
25	Domingos Orleans	Male	Community	Maulahulo
26	Cristovao Magno	Male	Community	Maulahulo
27	Madalena da C.	Female	Community	Maulahulo
28	Abina de Jesus	Female	Community	Maulahulo
29	Albertinha da C.	Female	Community	Maulahulo
30	Benedita da C.	Female	Community	Maulahulo
31	Manuel Marques	Male	Community	Maulahulo
32	Apolinario da C.	Male	Community	Maulahulo
33	Jaree Pereira	Male	Community	Maulahulo
34	Domingas	Female	Community	Maulahulo
35	Isabel da Costa	Female	Community	Maulahulo
36	Brono da Silva	Male	Community	Maulahulo
37	Armando Alves	Male	Community	Maulahulo
38	Miranda da C.	Female	Community	Maulahulo
39	Agapito de Araujo	Male	OPS/PNTL	Maulahulo

40	Bento Alves	Male	MAE	Maulahulo
41	Francisco de A.	Male	MAP	Maulahulo
42	Fernando de A.	Male	MAP	Maulahulo
43	Manuel de Araujo	Male	Community	Leorema
44	Jose da C.	Male	Community	Leorema
45	Hilario da C. B. Soares	Male	MAE	Hatobuilico
46	Luis de Araujo	Male	Community	Hatobuilico
47	Julio da Costa	Male	Community	Hatobuilico
48	Domingas	Female	Community	Maulahulo
49	Jaime Cardoso	Male	Community	Leorema
50	Manuel F.	Male	INAP	Leorema
51	Lorenca Ximenes	Female	Community	Maulahulo
52	Rita Ximenes	Female	Community	Maulahulo

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO NUNUMOGGE SUB-VILLAGE OF QUEOREMA BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 14 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Armando de Araujo	Male	Administrator of Hatobuilico municipality post	Hatobuilico
2	Raul Amaral	Male	PNTL	Hatobuilico
3	Hilario da C. B. Soares	Male	Suco Chief	Hatobuilico
4	Francisco X. Lopes	Male	Chief of sub village	Queorema
5	Domingos Lopes	Male	Ex. Administrator	Queorema
6	Agapito de Araujo	Male	OPS Mulo	Hatobuilico
7	Carlito de Araujo	Male	EDTL	Hatobuilico
8	Francisco de Araujo	Male	Guarda Florestal	Hatobuilico
9	Tomas Alves	Male	Agriculture	Hatobuilico
10	Aliansa A.	Female	Agriculture	Hatobuilico
11	Amelia X.	Female	Agriculture	Hatobuilico
12	Armino Doutel	Male	Agriculture	Blehet
13	Roberto de Araujo	Male	Teacher	Queorema
14	Gregoriu da C. B. Ararajo	Male	Agriculture	Hatobuilico
15	Pedro X. Lopes	Male	Teacher	Queorema
16	Valenti Marques	Male	Agriculture	Queorema
17	Albino Pereira	Male	Chief of sub village	Laquicu
18	Bento Alves	Male	Staff of MAE	Blehet
19	Victor da C.	Male	CPL	Queorema
20	Felisberto de Araujo	Male	Agriculture	Queorema
21	Afonso C. Lopes	Male	Agriculture	Queorema
22	Hermenegildo Mota	Male	Professor / Teacher	Blehet
23	Januario de Araujo	Male	Community	Queorema
24	Filomena J. F.	Female	Teacher	Queorema
25	Evangelino de J.	Male	Community	Queorema

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO NUNUMOGGE SUB-VILLAGE OF QUEOREMA BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 14 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
26	Agustinho P.	Male	Community	Queorema
27	Hermenegildo Mota	Male	Agriculture	Blehetto
28	Luis Seran	Male	Agriculture	Queorema
29	Julio Ximenes	Male	Community	Queorema
30	Lourenco B.	Male	Community	Queorema
31	Marcelino Lopes	Male	Community	Queorema
32	Armando da J.	Male	Community	Queorema
33	Arlindos S. Lopes	Male	Community	Queorema
34	Alfredo Pereira	Male	Student	Queorema
35	Mario de Deus	Male	KPK	Queorema
36	Miguel Ximenes	Male	Driver	Queorema
37	Andre de O. Araujo	Male	Student	Queorema
38	Deonísio Ximenes	Male	Student	Queorema
39	Adelino de Jesus	Male	Student	Queorema
40	Arnaldo Lopes	Male	Student	Blehetto
41	Marcal de Jesus	Male	Chief of sub village	Queorema
42	Lucio A. Sarmento	Male	Agriculture	Queorema
43	Jose de Araujo	Male	Assistant of Chief of sub village	Queorema
44	Abel Ximenes	Male	Student	Queorema
45	Seraldo Soares	Male	Agriculture	Mausormata
46	Marcos Soares	Male	Agriculture	Mausormata
47	Felismino	Male	Agriculture	Queorema
48	Octavio Casmero Lopes	Male	Agriculture	Queorema
49	Domingos de Araujo	Male	KPK	Hatobuilico

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO KATRAI KARAÍK SUB-VILLAGE OF HATUGEO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 15 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Juliao Marito de Deus	Male	Administrator of Letefoho municipality post	Letefoho
2	Afonso Salsinha	Male	Director DTPS Ermera	Ermera-Gleno
3	Alberto Salsinha	Male	Staff	Ermera-Gleno
4	Antonio de Deus	Male	PNTL	Dukorai
5	Tito Ribeiro do Rego	Male	PNTL	Letefoho Vila
6	Orlando Soares	Male	Chief of sub village Mausormata - A	Mausormata - A
7	Antonio Soares	Male	Chief of sub village Colcoli	Colcoli
8	Joao de Deus	Male	Chief of village Hatugeo	Hatugeo
9	Vicente de Deus	Male	Agriculture	Mausormata - A
10	Francisco Soares	Male	Community	Colocoli

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO KATRAI KARAİK SUB-VILLAGE OF HATUGEO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 15 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
11	Coli Bere	Male	Community	Colocoli
12	Carlos da C. Soares	Male	Suco Chief	Catrai Craik
13	Joanina Madeira	Female	Agriculture	Colocoli
14	Joao de Amaral	Male	Veteran	Mausormata - A
15	Manuel Araujo	Male	Agriculture	Hatugeo
16	Flacido Soares	Male	Agriculture	Colocoli
17	Jose de Deus	Male	Veteran	Colocoli
18	Antonio Lima	Male	Agriculture	Hatugeo
19	Marcos de Deus	Male	Agriculture	Colocoli
20	Alcinho de Deus	Male	Agriculture	Colocoli
21	Joao Soares	Male	Veteran	Colocoli
22	Antonio Berelequi	Male	Agriculture	Colocoli
23	Cipriano Soares	Male	Agriculture	Hatugeo
24	Manuel Soares	Male	Agriculture	Hatugeo
25	Agustinho Araujo	Male	Agriculture	Eratoi
26	Natalino Soares	Male	Agriculture	Colocoli
27	Moises Orleans	Male	Agriculture	Colocoli
28	Ernesto de Deus	Male	Agriculture	Eratoi
29	Juliao	Male	Agriculture	Hatuhei
30	Senaris Soares	Male	Agriculture	Colocoli
31	Jaquiel Soares	Male	Agriculture	Mausormata - A
32	Joao Lequibere	Male	Agriculture	Hatuhei
33	Antonio de Deus	Male	Veteran	Colocoli
34	Elias de Deus	Male	Agriculture	Mausormata - A
35	Araujo	Male	Agriculture	Mausormata - A
36	Jose de Deus	Male	Agriculture	Hatugeo
37	Fernando de Deus	Male	Agriculture	Colocoli
38	Miguel Soares	Male	Agriculture	Mausormata - A
39	Jose do Carmo	Male	Agriculture	Hatuhei
40	Jose de Deus	Male	Agriculture	Mausormata - A
41	Romaldo	Male	Agriculture	Mausormata - A
42	Mariano Soares	Male	Agriculture	Mausormata - A
43	Madalena Pereira	Female	Agriculture	Mausormata - A
44	Elisa Madeira	Female	Agriculture	Hatugeo
45	Domingos de Deus	Male	Agriculture	Hatuhei
46	Aliansa Ximenes	Female	Veteran	Colcoli
47	Juliana de Deus	Female	Agriculture	Colcoli
48	Amelia Felisidade	Female	Agriculture	Hatugeo
49	Agusta Soares	Female	Agriculture	Hatugeo
50	Alsinha de Deus	Female	Agriculture	Colcoli

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO KATRAI KARAİK SUB-VILLAGE OF HATUGEO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 15 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
51	Ernesto de Deus	Male	Agriculture	Colcoli
52	Rosita de Deus	Female	Agriculture	Hatugeo
53	Mausesta	Female	Agriculture	Hatugeo
54	Maria de Deus	Female	Agriculture	Mausormata - A
55	Lucia Soares	Female	Agriculture	Hatugeo
56	Seleste Soares	Female	Agriculture	Colcoli

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO DUCURAI BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 25 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Rafael Soares M.	Male	Chief of sub village	Sabelo
2	Domingos de Deus	Male	Chief of sub village	Rotutu
3	Celestino Tavares	Male	Chief of sub village	Leubado
4	Francisco Dias Soares	Male	Chief of sub village	Laclo
5	Julio de O.	Male	Chief of sub village	Eraloi
6	Alberto de Deus	Male	Chief of sub village	Lebululi
7	Manuel de Deus	Male	Chief of sub village	Manusae
8	Armando de Deus	Male	Assistant of chief of sub village Lebululi	Lebululi
9	Vasco Soares	Male	Chief of sub village	Renumata
10	Laurentino	Male	Agriculture	Eraloi
11	Mariano Soares	Male	Chief of sub village	Rae-rema
12	Estevao de Araujo	Male	Chief of sub village	Assui-Leten
13	Armando de Deus	Male	Agriculture	Rotutu
14	Joaquim de Desu	Male	Agriculture	Rotutu
15	Armando de Deus	Male	Agriculture	Rotutu
16	Florentino L. de Deus	Male	Agriculture	Manusae
17	Armando D. Soares	Male	Agriculture	Manusae
18	Manuel Soares	Male	Agriculture	Rotutu
19	Natalino Salsinha	Male	Agriculture	Manusae
20	Paul de Deus	Male	Agriculture	Sabelo
21	Pedro D. S.	Male	Agriculture	Rotutu
22	Atinu D. D.	Male	Agriculture	Rotutu
23	Daniel D.D.	Male	Agriculture	Rotutu
24	Carlos Soares	Male	Agriculture	Rotutu
25	Bosco D. Santos	Male	Agriculture	Rotutu
26	Tomas de Deus	Male	Agriculture	Manusae
27	Jeronimo A. de Deus	Male	Student	Manusae
28	Lourenco Sode	Male	Driver	Rotutu
29	Manuel de Deus	Male	Agriculture	Rotutu

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO DUCURAI BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 25th 2018				
No	NAME	GENDER	POSITION	ADDRESS
30	Armando Soares	Male	Agriculture	Rotutu
31	Justino Soares	Male	Driver	Rotutu
32	Jorge Piedade Maia	Male	Representative from the Church (religion)	Saeheun/Laclo
33	Rui A. Maia	Male	MAP	Saeheun/Laclo
34	Pe. Helio P. Ernesto	Male	Priest	Letefoho
35	Antonio de Deus	Male	PNTL	Dukurai
36	Juliao de Jesus	Male	Community	Letefoho
37	Saturnino de Deus	Male	Representative from the Church (religion)	Letefoho
38	Bagilio S. de Deus	Male	Driver	Sobelo
39	Valente Soares	Male	Chief of sub village	Assui-Kraik
40	Rui dos Santos	Male	Chief of sub village	Lacau
41	Mario de Deus	Male	Agriculture	Manusae
42	Juliao de Deus	Male	Agriculture	Rotutu
43	Celestino R. de Deus	Male	Agriculture	Rotutu
44	Pe. Helio P. Fernandes	Male	Priest	Letefoho
45	Rui Maia	Male	MAP	Letefoho
46	Adriano da Costa R.	Male	Suco Chief	Letefoho
47	Armando de Deus	Male	Councilor of Suco	Letefoho
48	Joao Felisberto de Deus	Male	Coordinator of Veterans	Dukurai

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO HAUPU SUB VILLAGE OF RAIPUSA BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 26th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Juliao M. de Deus	Male	Administartor	Letefoho
2	Eugebio A Maia	Male	Suco Chief	Haupu
3	Gilhereme da Gloria	Male	Chief of sub village	Haupu
4	Constancio Pd.	Male	Community	Haupu
5	Felix Soares	Male	Traditional Leader	Raipusa
6	Antonio de Deus	Male	PNTL	Dukurai
7	Abilio dos Santos	Male	OPS	Kailiti/Goulolo
8	Domingos Maia	Male	Chief of sub village	Raipusa
9	Abel de Deus	Male	Traditional Leader	Raipusa
10	Pedro de Deus	Male	Traditional Leader	Raipusa
11	Jose Soares	Male	Community	Raipusa
12	Francisco Vasconcelhos	Male	Community	Raipusa
13	Armando Soares	Male	Community	Raipusa
14	Mariano Maia	Male	Community	Raipusa
15	Benedito Afonso	Male	Community	Raipusa

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO HAUPU SUB VILLAGE OF RAIPUSA BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 26 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
16	Paulo Soares	Male	Community	Raipusa
17	Domingos Araujo	Male	Community	Raipusa
18	Carlito Soares	Male	Community	Raipusa
19	Pedro da Silva	Male	Community	Raipusa
20	David Vasconcelhos	Male	Community	Raipusa
21	Maria Maia	Female	Community	Raipusa
22	Zacarias Maia	Female	Assistant of chief of sub village	Raipusa
23	Alzira de Fatima	Male	Community	Raipusa
24	Alfredo S. da Silva	Male	Community	Raipusa
25	Luciano Soares	Male	Community	Raipusa
26	Belandino dos S. L.	Male	Community	Raipusa
27	Francisca da Cruz	Female	Community	Raipusa
28	Joana Lemos	Female	Community	Raipusa
29	Esmeralda Soares	Female	Community	Raipusa
30	Agrafina Soares	Female	Community	Raipusa
31	Lamberta Toni	Female	Community	Raipusa
32	Juliana Martins	Female	Community	Raipusa
33	Benedita da Costa	Female	Community	Raipusa
34	Luis de Deus	Male	MAP	Gleno, Ermera

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO GOULOLO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 22 nd 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Luis M. do Carmo	Male	CDO Letefoho	Letefoho
2	Antonio de Deus	Male	PNTL	Dukurai
3	Joao de Deus	Male	Suco Chief	Goulolo
4	Armando Exposto	Male	Chief of sub village	Goulolo
5	Jose dos Santos	Male	Chief of sub village	Goulolo
6	Domingos Reinaldo	Male	Traditional Leader	Goulolo
7	Thomas Soares	Male	OPS of Suco Goulolo	Letefoho
8	Francisco	Male	OPS of Suco Goulolo	Letefoho
9	Benedito Maia	Male	Agriculture	Goulolo
10	Luis Lolo	Male	Agriculture	Goulolo
11	Carlos Maia	Male	Agriculture	Goulolo
12	Agustinho Madeira	Male	Agriculture	Goulolo
13	Manuel dos Santos	Male	Agriculture	Goulolo/Kailiti
14	Armando de Jesus	Male	Agriculture	Goulolo/Kailiti
15	Manuel Maia de Jesus	Male	Agriculture	Goulolo/Kailiti
16	Paul Soares	Male	Agriculture	Goulolo/Kailiti

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO GOULOLO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 22nd 2018				
No	NAME	GENDER	POSITION	ADDRESS
17	Domingos dos Santos	Male	Agriculture	Goulolo/Kailiti
18	Arminda Lemos	Female	Agriculture	Goulolo/Goulolo
19	Adelina Ximenes	Female	Agriculture	Goulolo/Goulolo
20	Carlos de Deus	Male	Agriculture	Goulolo/Goulolo
21	Alberto M. Maia	Male	Agriculture	Goulolo/Goulolo
22	Damiao D. D.	Male	Agriculture	Goulolo/Goulolo
23	Luis dos Santos	Male	Agriculture	Goulolo/Kailiti
24	Eduardu	Male	Agriculture	Goulolo/Kailiti
25	Manuel	Male	Agriculture	Goulolo/Kailiti
26	Lourenso dos Santos	Male	Agriculture	Goulolo/Kailiti
27	Manuel Soares	Male	Agriculture	Goulolo/Goulolo
28	Armando Magalhaes	Male	Agriculture	Goulolo/Goulolo
29	Luis Fereira	Male	Agriculture	Goulolo/Goulolo
30	Georgina Soares	Female	Community (Youth)	Goulolo/Kailiti
31	Odete Maria	Female	Community (Youth)	Goulolo/Kailiti
32	Paulina Martins	Female	Community (Youth)	Goulolo/Kailiti
33	Flavia J. X	Female	Community (Youth)	Goulolo/Kailiti
34	Elfiana F. Agusta	Female	Community (Youth)	Goulolo/Kailiti

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO ERAULO BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 21 st 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Abilio dos Santos	Male	PNTL	Letefoho
2	Luis M. do Carmo	Male	Coordinator	Letefoho
3	Luis de Deus	Male	MAP	Gleno
4	Lourenco Soares	Male	Chief of sub village	Eraulo/Darudo
5	Carlos de Araujo	Male	Community	Eraulo/Darudo
6	Custodio Maia	Male	Community	Eraulo/Darudo
7	Xisto Madeira	Female	Community	Eraulo Madede
8	Fatima Soares	Female	Community	Eraulo/Darudo
9	Maria de Deus	Female	Community	Eraulo/Darudo
10	Leonilda Maia	Female	Community	Eraulo Madede
11	Cristina S. Martins	Female	Assistant of chief of sub village	Eraulo Madede
12	Adao M. Babo	Male	Chief of sub village	Eraulo Madede
13	Mario Soares	Male	Community	Eraulo Madede
14	Teodoro Madeira	Male	Community	Eraulo Madede
15	Bernardino de Deus	Male	Community	Eraulo Madede
16	Camilo Soares	Male	Community	Eraulo Manhehleta
17	Agustinho	Male	Community	Eraulo Madede
18	Marcelo Fatima	Male	Community	Eraulo Slere
19	Luis Sabino	Male	Technic of Livestock Letefoho	Eraulo Manhehleta
20	David Soares	Male	Community	Eraulo/Darudo
21	Geraldo C. Maia	Male	Community	Eraulo/Darudo
22	Horacio C. Maia	Male	Community	Eraulo Madede
23	Fernando Soares	Male	Community	Eraulo Madede
24	Evarsito S.	Male	Community	Eraulo Madede
25	Sipriano Soares	Male	Community	Eraulo Madede
26	Inacio Martins	Male	Community	Eraulo Madede
27	Mariano M. Soares	Male	Agriculture	Eraulo
28	Domingo M.	Male	Suco Chief	Eraulo
29	Jeronimo de J. B.	Male	Student	Eraulo
30	Antonio S.	Male	Student	Eraulo

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO ESTADO SUB VILLAGE OF SINAI BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 20 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Manuel Soares	Male	Comandante Esquadra PNTL Postu Ermera	Ermera
2	Julio Salsinha	Male	Suco Chief	Estado
3	Pedro de Deus	Male	Chief of sub village	Estado
4	Abilio de Deus	Male	Community	Estado

5	Gaspar Madeira	Male	Chief of sub village	Estado
6	Mateus Soares	Male	Community	Estado
7	Luis dos Santos	Male	Chief of sub village	Estado
8	Mario Martins	Male	Chief of sub village	Estado
9	Fernando Soares	Male	PNTL	Ermera
10	Marta S. Martins	Female	Assistant of chief of sub village	Estado
11	Mateus Casimeru	Male	Community	Estado
12	Romana Salsinha	Female	Agriculture	Estado
13	Odete Soares	Female	Agriculture	Estado
14	Gracilda Soares	Female	Agriculture	Estado
15	Abrao Salsinha	Male	Agriculture	Estado
16	Alberto Soares	Male	Agriculture	Estado
17	Pedro Lito Madeira	Male	Agriculture	Humboe
18	Domingas	Female	Agriculture	Estado
19	Gerlada Maia	Female	Agriculture	Estado
20	Helena Soares	Female	Agriculture	Estado
21	Terezinha Sal	Female	Agriculture	Estado
22	Isabel Soares	Female	Agriculture	Estado
23	Ines Soares	Female	Agriculture	Estado
24	Olandina Soares	Female	Agriculture	Estado

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO HUMBOE BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 19 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Calisto M. dos Santos	Male	Suco Chief	Humboe
2	Luis de Deus	Male	Chief of Forests Department	Gleno
3	Manuel Soares	Male	Comandante Esquadra Postu Ermera	Ermera
4	Gaspar M. Gomes	Male	Representative of Education Minister	Gleno
5	Ijino dos Santos	Male	OPS	Ermera
6	Carlos dos Santos	Male	Chief of sub village	Hatali
7	Jose Marcos	Male	Community	Borhei Humboe
8	Antonia F. Soares	Female	Assistant of Chief sub-village	Borhei
9	Junita G. Trindade	Female	Chief of sub-village	Borhei
10	Zeferino da C. Babo	Male	Assistant of Chief sub village	Borhei
11	Fernando Soares	Male	Forests	Borhei
12	Francisco Alves	Male	Agriculture	Bronsa Borhei Kraik
13	Antonio A. S.	Male	Agriculture	Cruzmanetu Santo Antonio
14	Duarte Salsinha	Male	Agriculture	Gouolu
15	Clementino Salsinha	Male	Agriculture	Hatmansua
16	Domingos Ximenes	Male	Agriculture	Gouolu

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO HUMBOE BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 19 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
17	Julio Carvalho	Male	Agriculture	Maldoro
18	Sergio Flores	Male	Agriculture	Hatmansua
19	Fernando B. Pereira	Male	Coordinator of the School	Riheu
20	Joao Maia das Neves	Male	Coordinator of the School	Lacogoa
21	Calisto M. da Cruz	Male	Veterans	Humboe
22	Mario M. exposto	Male	Agriculture	Borhei
23	Natalina de Deus	Female	Agriculture	Lacogoa
24	Jaime Salsinha	Male	Agriculture	Lacogoa

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO RIHEU BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 18 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
1	Felisberto S. M. Ximenes	Male	Suco Chief	Riheu-Ermera
2	Manuel Soares	Male	Comandante Esquadra PNTL Posto Ermera	Ermera
3	Rosario S. de Deus	Male	UNPAZ	Gleno
4	Antonio S. Pereira	Male	Ex. Chief of sub village	Riheu-Ermera
5	Maria Exposto	Female	Extension officer	Gleno
6	Manuel S. do Çeo	Male	Chief of sub village Gumhi	Riheu-Ermera
7	Venancio dos Santos	Male	Chief of sub village Raiburi	Riheu-Ermera
8	Jony F. Pereira	Male	Mangero	Riheu-Ermera
9	Marcelino C. Lima	Male	Community	Riheu-Ermera
10	Adolfo Soares	Male	Community	Riheu-Ermera
11	Carlos Martins	Male	Community	Riheu-Ermera
12	Agustinho T. M.	Male	Agriculture	Ermera Lisasa
13	Joao Soares	Male	Student	Riheu
14	Duarte Soares	Male	Agriculture	Sosoher/Riheu
15	Joao Carlos	Male	Agriculture	Sosoher
16	Gabriel de J. S.	Male	Agriculture	Sosoher
17	Mariano B.	Male	Agriculture	Raibliri
18	Miguel S. P.	Male	Agriculture	Manguero
19	Eliseu Soares	Male	Student	Raibliri
20	Manuel Soares	Male	Student	Raibliri
21	Constantinho M. Soares	Male	Community	Sosoher
22	Abrao Soares	Male	Agriculture	Sosoher
23	Agustinho A. Soares	Male	Agriculture	Gomhei
24	Joao Barreto S.	Male	Agriculture	Raibliri
25	Joao Sarmento	Male	Agriculture	Sosoher
26	Jose M. Sarmento	Male	Agriculture	Sosoher

ATTENDANCE SHEET OF PUBLIC CONSULTATION, SUCO RIHEU BRANCH ROAD SECTION DILI-AINARO (AITUTO-HATOBUILICO-LETEFOHO-GLENO) DATE: SEPTEMBER 18 th 2018				
No	NAME	GENDER	POSITION	ADDRESS
27	Januario Pereira	Male	Agriculture	Manguero
28	Domingos Soares	Male	Agriculture	Gomhei
29	Vasco Soares	Male	Agriculture	Gomhei
30	Gilberto Exposto	Male	Agriculture	Manguero
31	Ricardina dos Santos	Female	Agriculture	Gomhei
32	Miguel de Deus	Male	Agriculture	Sosoher
33	Joaninha de Deus	Female	Agriculture	Sosoher
34	Agusta dos Santos	Female	Agriculture	Sosoher
35	Moises Madeira	Male	Agriculture	Raibliri
36	Nayario TMS	Male	Agriculture	Manguero
37	Lucia Maia	Female	Agriculture	Gomhei
38	Armanda de Jesus	Female	Agriculture	Manguero
39	Cipriana Goncalves	Female	Agriculture	Gomhei
40	Maria Trindade S.	Female	Agriculture	Sosoher
41	Dulcia M. Sarmento	Female	Agriculture	Manguero
42	Almarino Madeira	Male	Agriculture	Manguero
43	Yovita L. Pereira	Female	Agriculture	Manguero
44	Nilton Soares	Male	Agriculture	Gomhei
45	Francisco Baptista	Male	Agriculture	Sosoher
46	Duarte Martins	Male	Agriculture	Manguero
47	Felis da Silva	Male	Agriculture	Sosoher
48	Domingos Pereira	Male	Agriculture	Manguero
49	Nelson Pereira	Male	Agriculture	Manguero
50	Serafin da Silva	Male	Agriculture	Sosoher
51	Alcino Pereira	Male	Agriculture	Manguero
52	Julio M. Pereira	Male	Agriculture	Manguero
53	Bras Texeira	Male	Community (Youth)	Manguero
54	Ricardo do Rosario	Male	Community (Youth)	Manguero
55	Graciano Madeira	Male	Student	Gomhei
56	Joni Alves dos Santos	Male	Chief of Health Environment	Gleno-Riheu
57	Eusebio C. M.	Male	Chief of Water & Sanitation Depratment	Gleno-Riheu

5.2. Photography







5.3. Baseline Data Questionnaire

**COMMUNITY CONFIRMATION ON ENVIROMENTAL AND SOCIAL CONDITION
FOR BASELINE INFORMATION OF THE STUDY
SUÇO: _____**

Today, _____; date of September _____, 2018; Public Consultation for the proposed Rehabilitation and Improvement of Branch Road Section Dili – Ainaro i.e. Aituto – Hatubuilico – Letefoho – Gleno has conducted at the office of Horai Quik Suço.

The Public Consultation attended by related stakeholders such as Municipality Administrator, Administrator Post Administrator, Chief of Suço, potential project affected people along the proposed road right of way (RRoW), representative of women group, representative of customary community, representative of pf related governments (*Plano Estratégico Nacional de Áreas Protegidas* – PNAP, National Directorate for Tourism Enterprise, Activities and Products (NDTEAP), Health Agency, Education Agency, Land and Property (*Terras e Propriedades*) include some related Civil Society Organization/Non-Government Organization.

The result of Public Consultation consists of understanding about the proposed Project of *Branch Road*, confirmation of any related impact, and additional on any related information as following:

No.	UNDERSTANDING/CONFIRMATION/INFORMATION
1	People understand that there is a proposed Project of Branch Road Section of Dili – Ainaro, which will start from Aituto to Hatubuilico, continue to Letefoho up to Gleno (total 60 km length).
2	People understand there will be any environmental and social impact during the Construction Phase.
3	People understand that the proposed Project may be impacted to their land, houses, fences, trees and agriculture products, other assets, including some utilities such as water tanks & pipes, electricity poles, communication tower/networks, etc. This impact will be minimized as much as possible. Off-setting of residual impacts will be taken by the Contractor during the civil work.
4	People inform that the suço has: _____ Ha land; _____ Ha customary land; _____ Ha customary forest; and _____ this will be informed to relevant forest agency and / or land and property agency.
5	People inform there are some water resources in suço area: _____ water spring/s; _____ units well; _____ m water pipes; _____ units water tank; _____ lakes; _____ rivers, named:
6	People inform there is an irrigation channel in their area, it functions for _____
7	People inform there are landslide areas within/near to suço area: _____
8	People inform there are cultural archeological/heritage/historical sites within 100 m of the Project as well as belong to suço (church, cemetery, and other). Name of the Cultural Heritage Site and Location are listed: _____
9	People inform there are material resources (gravel & sand) within/near to suço area, the location: _____
10	People inform that suço has area that can be used as disposal area, the location: _____
11	People inform there is tourism destination places: _____ or access within/near to suço area:

No.	UNDERSTANDING/CONFIRMATION/INFORMATION
12	People inform they have ever seen _____ of endangered bird/s within/nearby suco area, including _____ endangered tree/s species.
13	People confirm that landslide areas within/near to suco area were getting worse during rainy seasons.
14	People confirm that prior to start Project construction near to the cultural heritage site, should conduct such a customary ceremony.
15	People inform there is protected forest area in the suco area: _____
16	People inform Indigenous People exist in the suco area, which is _____
17	People confirm the land 3-4 meter of both side road right of way belongs to the government for the development of public facilities/project. When the Branch road project requiring more land area outside of the Road Right of Way, voluntary land donation may be expected to be applied.
18	People confirm the need of Gender Equality (women participation in planning, road construction, maintenance, bioengineering activities, and receive equal pay for work of equal value) and avoid of children labor in the construction work.

Chief of Suco	Administrator Post Administrator

Municipality Administrator	

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APPENDICES

Appendix 6 – Construction ESMP Guidelines

A) Waste Disposal (general waste, spoil disposal and hazardous waste)

1. The Waste Disposal section of the CESMP will include methods for waste management and spoil disposal for handling, storage, treatment, transport and disposal of solid and liquid wastes, hazardous materials, hazardous wastes, and excavation spoils. The CESMP will also provide details of a trip ticket system to ensure that Contractor disposes of excavation spoils in approved areas. Such system will be designed so that the PMU and PISC could readily monitor the volume and disposal site of excavation spoils, and to ensure that the total volume of spoils disposed of will not exceed the maximum capacity of disposal sites approved by local authorities.
2. The Waste Disposal - General Waste section of the CESMP will include method statements and consideration of all matters related to general solid and liquid waste disposal including:
 - Expected types of waste and quantities of general waste arising;
 - Waste reduction, reuse and recycling methods to be employed;
 - Agreed reuse and recycling options and locations for spoil disposal (endorsement from NDE and local groups);
 - Methods for treatment and disposal of non-hazardous solid and liquid wastes;
 - Methods of transportation to minimize interference with normal traffic;
 - Establishment of a complaints management system for the duration of the works;
 - Programme for waste disposal at the areas designated in the Environmental license (e.g. Tibar landfill etc, if required by NDE).
3. The Waste Disposal - Spoil Disposal section of the CESMP will include method statements and consideration of the following:
 - Locations and quantities of spoil arising;
 - Agreed locations for spoil disposal (endorsement from NDE and local groups);
 - Methods of transportation to minimize interference with normal traffic;
 - Establishment of acceptable working hours and constraints;
 - Agreement on time scale and programme for disposal and chain of custody;
 - Agreement on publicity/public consultation requirements and use of signed waiver (for disposal on private land and advance permission/signing etc.);
 - Details of a trip ticket system including the excavation and disposal record forms, to ensure that Contractor disposes of excavation spoils in approved areas. Such system will be designed so that the PMU and PISC could readily monitor the volume and disposal site of excavation spoils, and to ensure that the total volume of spoils disposed of will not exceed the maximum capacity of disposal sites approved by local authorities;
 - Programming issues including the time of year and available resources;
 - Discussion of the PMU/MPW inspection/monitoring role.
4. The Waste Disposal - Hazardous Waste section of the CESMP will include method statements and consideration of all matters related to hazardous solid and liquid waste disposal including:
 - Methods for collecting, handling, include treatment and disposal of solid and liquid hazardous wastes;
 - Establishment of regular disposal schedule and constraints for hazardous waste;

- Discussion of the PMU/MPW inspection/monitoring role.
- Programme for waste disposal at areas designated in the Environmental License. As much as possible the designated area should be within the Ermera Municipality.

B) Quarries, Borrow Pit Areas and Materials Management

5. In the preconstruction stage, the Contractor will review the requirements for the provision of construction materials and include the Quarries, Borrow Pit Areas and Construction Materials Management section of the CESMP. The CESMP will seek, as far as is reasonably practicable, to minimize the use of non-renewable resources and rock-based materials and also to balance cut and fill requirements and contribute to the minimization of impacts due to the extraction of rock-based materials. Firstly, the material resources shall consider of the location which not in the area of 2000 meter and above accordingly, given topography condition made it as protected areas. Meanwhile, where surplus materials arise from the removal of the existing surfaces these will be used elsewhere on the project or other projects for fill (if suitable) before the additional rock, gravel or sand extraction is considered. The PISC team has estimated that almost 100% of cut materials may be reusable as bulk fill in many areas.
6. The Quarries, Borrow Pit Areas and Materials Management section of the CESMP will include method statements and details of arrangements to be made to facilitate the timely production and supply of construction materials to avoid impacts due to unnecessary stockpiling outside the project site.
7. The CEMP will include as a minimum consideration of the following:
 - The required volume of materials, potential sources and estimated quantities available;
 - Impacts to identified sources and availability;
 - Excavated slope material for reuse and recycling methods to be employed;
 - Required endorsements that should be obtained by the Contractor from NDE and local groups for use of legitimate sources;
 - Measures to be employed to mitigate nuisances to village residents;
 - Methods of transportation to minimize interference with normal traffic;
 - Constraints of regular delivery schedule to reduce stockpiling on site;
 - Programme for reuse of slope excavated material for reuse;
 - Programme for delivery of quarry and borrow materials;
 - Discussion of the PMU/MPW inspection/monitoring role;
 - Agreement on publicity/public consultation requirements.

C) Blasting and Vibration

8. There is no reason to expect that blasting will be required at this stage however it may be required in special circumstances. Alternatively, the Contractor may wish to keep open the option to use blasting if unexpected conditions are encountered that prevent the use of powered mechanical equipment to remove the rock. In the event that blasting is to be considered, even if only in special circumstances, the Contractor shall include a section on blasting in the CESMP that will include method statements and consideration of the following matters:
 - Controlled blasting methods in line with the rules set down by the local authorities and NDE;
 - Limitations to permissible times and intervals between blasting;

- Details of the prescribed manner of blasting and precautionary measures to be included;
- Prior notice to all village residents;
- Undertaking prior condition surveys of residences within 500 m of the blast sites. All residents within 500 m of the blast sites;
- Measures to keep Local Government Units and the public informed of the plans and progress of blasting;
- Measures for temporary evacuation and provisions for alternative accommodation if required;
- Discussion of the PMU/MPW on the inspection/monitoring role.

D) Asphalt, Hot Mix Plant, Stone Crushing and Bitumen Supply

9. The stone crushing activities will generate noise and dust and pavement works will generate gas and odor from the asphalt hot-mix plant and noise from the compaction of the pavement. The Contractor shall include a section on Asphalt, Hot Mix Plant, Stone Crushing, and Bitumen Supply in the CESMP that will include method statements and consideration of the following matters:
- Estimation of volumes of rock-based material and asphalt required;
 - Use of existing cement batching, aggregate and hot mixing plant or proposals for new installations;
 - Locations of cement batching and aggregate mixing plant as far as possible from settlements and habitation;
 - Locations of cement batching and aggregate mixing plant in agreement with the local town or municipality and to be approved by PMU;
 - Licenses for operation of plant and approval from the relevant local authority and NDE;
 - Dust suppression equipment to be installed;
 - Proposals for storage, handling, use and disposal of residual bitumen in line with the waste disposal section of the CESMP;
 - Duration and timing of the proposed operation and cement batching and aggregate mixing plant;
 - Discussion of the PMU/MPW inspection/monitoring role.

E) Erosion Control

10. The erosion Control section of the CESMP will include method statements to ensure that construction works will not cause excessive runoff and siltation of adjacent waterways within the project site. The Erosion Control section of the CESMP and slope stabilization measures in the detailed designs will be implemented and maintained by the Contractor during construction to protect the works. The CESMP will have sufficient provisions to ensure stabilization of cut slopes and other erosion-prone areas, minimize hydrological impacts, flooding and erosion of river banks and adjacent areas and to protect the works under construction. The CESMP will include the following to control erosion and runoff:
- Climate and rainfall for the area and checking weather forecasts;
 - Terrain and typical locations particularly susceptible to erosion and runoff;
 - Protection of the works and potential impacts on the environment;
 - Erosion control methods to be employed, locations and installation timing;
 - Limits to stockpiling on sites near waterways and irrigation channels;
 - Discussion of the PMU/MPW inspection/monitoring role;
 - Agreement on publicity/public consultation requirements.

F) Bridge Repairs and River Protection

11. The project proposes to repair or construct a new bridge as well as repair or construct new culverts. Careless construction and poor material control can cause physical blockage to rivers and streams resulting in adverse impact on water quality and flow regime. Therefore the CESMP will have sufficient provisions to ensure control of physical aspects of Bridge Repairs and River Protection including the following matters:

- Programme for work near rivers (for the dry season as far as practicable);
- Avoidance of blocking rivers and streams through improper disposal of rock-based materials;
- Methods to be used to avoid dropping bridge sections or culvert into rivers/streams;
- Covering of open surfaces to reduce runoff and bank erosion;
- Dewatering and cleaning of cofferdams;
- Location of settling basins or containment units;
- Discussion of the PMU/MPW inspection/monitoring role.

G) Water Contamination Prevention

12. Work near rivers and streams have the potential to cause water pollution. In order to prevent water contamination the CESMP will include coverage of the following to be undertaken by the Contractor:

- Disposal of solid waste from construction activities away from rivers;
- Design of storage areas with enough lining for lubricants and other construction storage/stockpiles;
- Handling of stockpiled materials to avoid leakage and prevent runoff;
- Location of stockpiling or borrow sites and storage for hazardous substances;
- Responses to complaints, complaints monitoring and investigation of water quality;
- Scheduled work duration in near rivers shall be as short as possible;
- Immediate stabilization of slopes after works are completed;
- Prohibition of washing of machinery and vehicles in surface waters.

H) Dust and Noise Minimization

13. Earthworks and rock crushing activities will cause dust impacts. All construction works will involve some noisy activities and it is good practice to control dusty materials and noisy activities at source so that nuisances do not occur. The Dust and Noise control section of the CESMP will include method statements and minimize impacts to sensitive receptors (residential areas, schools, hospitals, etc.) due to construction works, sourcing and transport of construction materials, and other project-related activities. In order to prevent dust and noise nuisances the Dust and Noise control to a section of the CESMP will include the following:

- Use and availability of water for damping down dust in wet and dry seasons;
- Alternative use of dust barriers/segregation between the works and sensitive receivers;
- Locations and timing of works within 500 m of settlements including night works;
- Reporting of complaints to PMU in line with the Grievance Redress Mechanism;
- Compliance of heavy equipment and machinery with best practice on pollution;
- Ban on smoke-belching vehicles and equipment;
- Covering vehicles transporting loose construction materials;
- Speed limits on vehicles unpaved areas near works;

- Methods to reduce the need for large stockpiles and planning of supplies of as per the Construction Materials Management section of the CESMP;
- Location of stockpiles and enclosing or covering when not in use;
- Description of any monitoring proposed by the Contractor in addition to the PMU/DSC monitoring role.

I) Tree Cutting and Replanting

14. In several places, the natural vegetation inside and immediately outside the ROW for a few meters has been cut down to make way for the distribution of electrical poles that were set out in recent years. The habitats outside this corridor are vulnerable to further loss due to increasing pressure (limited extent and over-exploitation) for fuel, timber, and food. This underscores the need for mitigation measures to protect the remaining habitats from exploitation during the project construction.
15. Tree-cutting and Replanting section of the CESMP will include method statements in line with the usual procedures of DRBFC to ensure there is no indiscriminate tree-cutting by clearly defining areas where vegetation removal is necessary. Tree-cutting should be based on project requirements and that replanting or remuneration paid to local tree owners shall be completed after consultation with owner and compensation as per Resettlement Framework and usual DRBFC process (in-kind following consultation and negotiation). The Tree-cutting and Replanting section of the CESMP will include method statements in line with the agreed procedures for:
 - Advance notice to PMU on any trees that need to be cut to complete the detailed designs;
 - Confirmation and identification of trees to be cut and locations by chainage following the detailed designs;
 - Planning cutting and any replanting and compensatory planting with the local forest authority and District DRBFC;
 - Appointment of a bird specialist with thorough knowledge of avifauna in Timor Leste region to observe and examine the presence of bird's nest prior to trees removal (see detailed mitigation in Table 10.4 and in ESMP).
 - Ban use of wood as a fuel for the execution of any part of the project works;
 - Avoiding construction camps, asphalt mixing plants, material storage sites in forests, near springs, sacred sites or other previously identified sensitive areas;
 - Control of accidental fires and ban on burning of waste;
 - Prohibitions on workers entering mangrove communities and forests for taking firewood;
 - The justification for tree cutting as an alternative to road realignment;
 - Obtaining permissions from landowners, authorities, and permits from NDE for cutting;
 - Methods for marking, protection of uncut cut trees and limitations to cutting;
 - Methods and timing for safe cutting to minimize interference with normal traffic;
 - Methods to remove trees, cut timber and avoid stockpiling cut brushwood on site;
 - Methods to avoid undercutting adjacent tree-lined slopes;
 - Preliminary programme for cutting trees and enhancement planting (to be updated in progress reports);
 - Discussion of the PMU/MPW inspection/monitoring role;
 - Agreement on publicity/public consultation requirements.

J) Enhancement Planting

16. Environmental enhancements such as on-site planting at used worker camps, or off-site tree planting for long term soil stabilization included in the detailed designs will be identified in the CESMP by the Contractor. The enhancement Planting section of the CESMP will include:
- Locations of enhancement planting required in detailed design;
 - Provide enhancement planting at construction worker campsites after use;
 - Maintenance and monitoring for planted specimens as agreed with the PMU;
 - Discussion of the PMU/MPW inspection/monitoring role.

K) Construction Camps, Sanitation and Diseases

17. The operation of the Contractor worker camps will cause impacts from the generation of raw sewage, wastewater effluent, and construction debris waste materials for disposal, air, and noise pollution. Waste and control of other impacts will be in line with other sections of the CESMP. Additional measures included in the construction camps section of the CESMP will include:
- Proposed location of construction worker camps to be agreed with local communities and PMU;
 - Hiring and training of local workers;
 - Provisions to be made for potable water, clean water for showers, hygienic sanitation facilities/toilets, worker canteen/rest area and first aid facilities;
 - Provisions for adequate accommodation for workers;
 - Provisions for wastewater effluent capture and treatment from worker facilities and Contractor workshops and equipment washing-yards before discharging;
 - Solid and liquid waste managed in line with waste disposal practices agreed in the CESMP;
 - Use of borrow pits and natural depressions for construction camp waste disposal and options for completely or partially recycling wastes;
 - Provision of food from local farm/suppliers;
 - Ban on hunting and bushmeat supplies to discourage poaching and gathering of green timber;
 - Ban on entry to the mangrove areas, forests and protected areas by workers;
 - Provisions to clean construction worker campsites after use and dispose of all waste materials to approved disposal sites;
 - Provisions to restore land used for campsites and the area be planted with appropriate trees/shrubs as an enhancement.
18. Sanitation and diseases will mainly be concerns at the construction worker camps. The Contractor will ensure that additional measures to maintain hygienic conditions in the camps and implement the social and health programmes for the project are included in the CESMP:
- Measures to prevent the proliferation of mosquitos;
 - Temporary and permanent drainage facilities to prevent the accumulation of surface water ponds;
 - Implementation of the social and health programmes for the project (e.g. HIV-AIDS education as required in line with social programmes).

L) Power - Utilities Protection and Deprovisioning

19. The power and utility protection and a reprovisioning section of the CESMP will include method statements and to minimize interruption to power, water supply, and telecommunications to

protect them during the works. The requirements need to be reassessed and reconfirmed by the Contractor before works commence. Therefore the Contractor will include measures to protect power and utilities in the CESMP as follows:

- Consultation with PMU and MPW and utility providers to reconfirm power, water, and telecommunications systems likely to be interrupted by the works and any additional trees to be cut to make room for replacement utilities;
- Contact points in all relevant utilities, local authorities, and local village groups to plan to re-provision;
- Approach to coordinating relocation of utilities ahead of construction works with the relevant utility company at the municipality and municipal levels and reconnection;
- Information to be provided to affected communities should be timed well in advance;
- Emergency provisions and action plan for immediate repairs to utilities if accidentally damaged.

M) Drainage System, Irrigation and Water Resources

20. The natural streams and drains, irrigation channels running close to works areas and water resources on surrounding lands may be affected by construction activities. Local water supplies will need to be tapped to meet campsite and construction requirements. This section of the CESMP will include method statements and to prevent ponding/flooding within the project site, construction camps, borrow/quarry areas, other areas used for project-related activities and adjacent areas. The Contractor will be required to implement drainage management and provide measures to mitigate adverse impacts on water resources and surface drainage patterns and describe them in the CESMP. The Drainage System, Irrigation and Water Resources section of the CESMP will include method statements covering the following:

- Provision of appropriate temporary drains and measures to keep storm drains and road drainage systems clear of construction debris;
- Identification of any irrigation channels to be avoided or de-provisioned and timing for de-provisioning in advance of the commencement of road works to the satisfaction of PMU in MPW and local community;
- Availability of water for the works including consultation with the local authorities;
- Arrangements to bring in water by tanker without depleting local village supplies;
- Guidelines to minimize the wasting of water during construction operations and at campsites.;
- Preparations (in case of obstruction or damage due to the works) for immediate clearance or repairs to drainage channels, irrigation ditches, and supply ponds;
- Arrangements for close liaison with local communities to ensure that potential conflicts related to common resource utilization are resolved quickly.

N) Safety Precautions for Workers and Public

21. Workers and Public Safety section of the CESMP will include method statements to identify safe working practices and interfaces between the works and public to ensure worker and public safety and prevent accidents due to the construction works. Workers and Public Safety section of the CESMP will include:

- Statutory requirements for worker occupational health and safety is governed by the 2012 Labour Code of Timor-Leste, which provides for the rights of employees, including basic occupational health and safety guarantees and prohibition of sexual harassment at work;
- Method statement of how the Contractor work practices will comply with statutory requirements;

- Arrangements to protect public safety;

O) Temporary Traffic Management

22. Arrangements for vehicles accessing the project area will be formulated to avoid community disturbance and severance and will at least retain a passing lane along all roads used during construction. The Temporary Traffic Management section of the CESMP will include method statements and to minimize disturbance of vehicular traffic and pedestrians during construction including consideration of the following:

- Lane availability and minimizing interference with traffic flow past the works site;
- Establishment of acceptable working hours, constraints and public safety issues;
- Agreement on time scale and establishment of traffic flow/delay requirements.
- Programming issues including the time of year and available resources;
- Discussion of the PMU/MPW inspection/monitoring role;
- Establishment of a complaints management system for the duration of the works;
- Agreement on publicity/public consultation requirements (advance signing etc.).

P) Accidental Discovery of Archaeological Assets

23. Timor Leste has an archaeological heritage and therefore the contractor will establish precautionary measures to be included in the CESMP implemented to avoid disturbance of any unexpected finding of archaeologically valuable artifacts.

Q) Decommissioning, Rehabilitation, Revegetation and Recontouring of Borrow Areas

24. Borrow areas and construction material processing areas should be decommissioned and rehabilitated toward the end of the construction activities. Borrow pits should be reclamation with suitable material while construction material processing areas are cleaned up from spoil, scarifying materials, bituminous spill, and other atypical materials. Recontouring should be pursued in areas that are severely impacted as not to create a hazardous condition for the local community. Slopes cutting should be left in the non-hazardous state with proper cut angle according to the type of material. Revegetation should be pursued on suitable locations with local fast-growing species or other species in consultation with landowner or village chiefs. Replanting should be conducted as early as possible to allow for sufficient early care needed for the plants to grow well.