Ministry of Infrastructure

Timor Leste

Project Management Unit

DRAFT

INITIAL ENVIRONMENTAL EXAMANATION (IEE)

A04-01 Tibar – Gleno

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Asian Development Bank
Road Network Development Sector Project

ADB Grant No. 0180-TIM
Project Implementation and Support Consultants

EXECUTIVE SUMMARY

This Initial Environmental Examination (IEE) has been prepared as a part of the 'Project Implementation and Support Consultants for the Road Network Development Sector Project – ADB Grant No. 0180-TIM' for the National Road Tibar-Gleno (A04-01) referred to as 'sub-project road'. This IEE is part of the continuing process of compliance with the Government of Timor-Leste's (GoTL) environmental regulations and guidelines and ADB environmental safeguards policies. This IEE with the integrated EMP shall likewise serve as the basis for securing environmental permit from the National Directorate for Environmental Services (DoE).

The proponent of the project is the Ministry of Infrastructure, Government of Democratic Republic of Timor-Leste and is supported by international and national consultants with funding support from the ADB.

The sub-project road link A04-01 is located in the districts of Liquica and Ermera This road link has a total length of 31.9 km. The proposed works will include widening, repair and restoration with an option to apply full asphalt concrete overlay. The design width of the shoulder is 1.0m (one side) in flat terrain and in mountainous terrain. The design width of asphalt pavement is 6m. In some cases where houses/structures are present and land is privately owned, the current road width (i.e. 0.75m shoulder and 5 to 6m asphalt pavement) shall be maintained. Slope trimming will be done in certain sections to attain width for the drainage and shoulder.

As for drainage, new works are proposed only in areas where present design is inadequate. Otherwise works will only consist of cleaning or reconstruction as necessary. Provisions of retaining structures are also part of the proposed works for A04-01. As part of road safety, the project will include provision of pavement marking, provision of road signs and regular maintenance of drainage.

This road is part of the most important north-south road linking Dili to the inland districts. The project road is an important trade link for Timor Leste, since it provides road connectivity to the important coffee growing region of the country and also provides alternate link to Maliana and the Indonesian part of the island. As planned, this road sub-project will improve connectivity on the local as well as regional level. It would support sustainable development, facilitate in reducing poverty, and improve access to the markets and social services for the residents of the districts served by the road.

The road starts at the junction of Dili-Tibar-Liquica near the coast and heads south into the upland area of Ermera. It goes over mountainous terrain of Ermera, reaching elevation of over 800 m asl. Road A04-01 traverse the built up areas of Tibar in the District of Liquica and district of Ermera, coffee plantations beyond Km26+000 as well as rice fields in Railaco and Gleno

Based on the initial environmental examination and screening of anticipated impacts over physical, ecological, and socio-economic environment; it is concluded that the proposed selective widening, repair, restoration and bituminous overlay for A04-01 is a 'Category – B' project as per the categorization criteria of ADB and statutory guidance of Timor-Leste. The proposed activity is unlikely to result in significantly adverse environmental impacts of irreversible nature. Most impacts would be of reversible nature and are expected to remain within the existing right of way. However, since widening will be undertaken, loss of coffee plants nearest to the road, especially those located downslope, is inevitable. The loss will be compensated and an inventory of the coffee plantation that will be affected has been conducted.

No significant environmental impacts associated with the road rehabilitation have been anticipated since rehabilitation will be confined within existing alignment and the works will be temporary in nature and of short duration. An EMP has to be crafted to protect the human settlements along the road, the sensitive ecosystems and cultural and heritage features that might be encountered along the sub-project corridor. Corresponding mitigation measures are presented in the EMP. Among the potential key impacts identified during the construction stage of this sub- project are: fugitive dust, noise, pollution of water bodies, increased erosion and siltation, occupational and public health and safety and impacts on heritage and cultural resources

The institutional responsibility for EMP implementation is shared by the Ministry of Infrastructure (PMU) as implementing agency, the Project Implementation Support Consultant (PISC), the

General Contractor, the stakeholders (host communities), the Directorate of Environment and ADB. The primary role for EMP implementation and monitoring belongs to the MoI / PMU with the support from the PISC and compliance by the Contractor. Additional support for monitoring is provided by the stakeholders who have been engaged early on. The DoE is primarily responsible for enforcing the GDRTL's environmental regulations. Finally, as an ADB funded project, its responsibility is to ensure that the project complies with its safeguards policies.

Thus, it is concluded that the nature of the proposed activity and low volume of traffic on the sub-project road, now or in the foreseeable future, further supports the finding that there will be no significant indirect or induced impacts on the physical and ecological environment. Therefore the IEE for the sub-project road complies with the ADB's environmental safeguard policies. The Environmental Monitoring Plan given in the IEE provides sufficient guidance for the PMU to successfully implement the EMP and to monitor and report the environmental compliance throughout the project implementation period.

Despite the project road's alignment traversing through an ecologically sensitive and biodiversity significant area, signs of traffic-wildlife conflict are not apparent. Project road is neutral towards the illegal logging and hunting; which are subject to policing, law and order. By maintaining the road in its existing lane configuration, long term adverse impacts on the agricultural lands and forested areas are not likely to arise; therefore no additional or special studies are needed at this stage.

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List of Abbreviations

ADB	Asian Development Bank
ALGIS	Agricultural Land-use Geographic Information System (ALGIS) based
BVA	biological value area
CBD	United Nation's Convention on Conservation of Biodiversity
CCD	United Nation's Convention to Combat Desertification
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO	Carbon Monoxide
DTP	Directorate of Land and Property
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FCCC	Framework Convention on Climate Change
FI	Financial Intermediately
GDRTL	Government of Democratic Republic of Timor Leste
GIS	Geographic Information System
Ha	Hectars
HC	Hydrocarbon
HDI	Human Development Index
HVAS	High Volume Air Sampler
IBA	Important Bird Area
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature
MAFF	Ministry of Agriculture and Forestry
MODIS	Moderate-Resolution Imaging Spectro-radiometer Images.
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautical and Space Administration
NASA	National Aeronautical and Space Administration (),
NGO	Non-Governmental Organization
NO_x	Oxides of Nitrogen
NW	North West
OCHA	United Nation's Office for the Coordination of Human Affairs
PIA	Project Influence Area
PM_{10}	Particles of 10 micrometers or less in aerodynamic diameter
$PM_{2.5}$	Particles less than 2.5 micrometers in aerodynamic diameter
PMU	Project Management Unit
PSA	Poverty and Social Assessment
ROW	Right-of-way
RSMC	Regional Specialised Meteorological Centre
RSPM	Respirable Particulate Matter
SE	South East
SIEE	Summary Initial Environmental Examination
SLM	Sustainable Land Management
SMEC	Snowy Mountain Engineering Corporation
SO_2	Sulphur Dioxide
SPM	Suspended Particulate Matter
SPOT	Satellite Pour l'Observation de la Terre

TA	Technical Assistance
THC	Total Hydrocarbons
TSP	Total Suspended Particulate
UK	United Kingdom
UN	United Nation
UNCED	United Nations Conference on Environment and Development – 'Earth Summit'
UNDP	United Nations Development Programme
UNTAET	United Nations Transitional Administration for East Timor
USGS	United States Geological Survey
WGS84	World Geodetic System 84
WHO	World Health Organization
WMO	World Meteorological Organization

1. INTRODUCTION

1.1 Purpose of The IEE

This initial environmental examination (IEE) is part of the efforts to comply with the Government of Timor-Leste's (GoTL) environmental regulations and guidelines and the ADB environment and social safeguards guidelines. The road link A04-01 – Tibar to Gleno is one of the roads under the ADB Grant No. 0180-TIM.

The IEE describes the environmental measures needed to prevent and/or mitigate negative environmental effects associated with road repair and rehabilitation project. The IEE provides a description of the direct and indirect environmental effects associated with the proposed subproject during key periods of work. The IEE (1) describes the extent, duration and severity of the impacts, (2) analyzes all significant impacts, (3) formulates the mitigation actions and presents it all in the form of an Environmental Management Plan or EMP. The IEE also serves as a basis for ADB to assess the project's environmental thresholds and determine whether a more thorough environmental assessment in the form of an environmental impact assessment (EIA) is needed to address the more significant components and impacts.

This IEE report presents the findings and recommendations of the environmental assessment of the sample road link proposed by the Ministry of Infrastructure. Its purpose is to ensure that environmentally sound practices are incorporated into project design, and potential negative impacts will be avoided or mitigated to acceptable levels. The environmental assessment process follows and complies with Timor-Leste regulatory framework and ADB requirements.

This IEE with the integrated EMP shall likewise serve as the basis for securing environmental clearance from the National Directorate for Environmental Services (DoE) for this particular sub-project on road link A04-01- Tibar to Gleno.

1.2 Identification of the Project and Project Proponent

This Initial Environmental Examination (IEE) is prepared as a part of the 'Project Implementation and Support Consultants for the Road Network Development Sector Project – ADB Grant No. 0180-TIM' for the National Road from Tibar to Gleno, ADB Grant 0180 TIM hereafter collectively referred to as 'sub-project road'.

The Ministry of Infrastructure, Government of Democratic Republic of Timor-Leste is the project proponent with support from international and national consultants provided through this Grant.

1.3 The Nature, Size, Location and Importance of the Project

The road A04-01 runs between Tibar and Gleno with a length of 31.9 km. This road is linked with the Road A03-01 (Dili-Tibar) at a junction at Tibar. From Tibar, the road splits into two branches - one leads to Liquica (Road A03-02: Tibar-Liquica); and the other connects Tibar with Gleno and is called Road A04-01 (Tibar-Gleno). This is a part of the continuous track between Dili and Gleno via Tibar. From Gleno, this road merges into Road A04-02 (Gleno-Ermera). These road links form an important access network from the capital Dili to Mota Ain (Timor-Indonesia Border) and the southwestern section of the country, particularly Maliana. Road A04-01has bituminous paved surface and a width of 4.6 meters. Surface condition of some sections of the road is good and ride quality is fair, but there are sections that have subsided and shoulders eroded. The proposed works will include widening, repair and restoration with an option to apply full asphalt concrete overlay. The design width of the shoulder is 1.0m (one side) in flat terrain and in mountainous terrain. The design width of asphalt pavement is 6m. In some cases where houses/structures are present and land is privately owned, the current road width (i.e. 0.75m shoulder and 5 to 6m asphalt pavement) shall be maintained

Based on its strategic importance, engineering assessments and economic analysis, the 'Ten Year Investment Plan for Timor-Leste National Road Network', developed during the Phase-1 of ADB's TA 7100-TIM has identified the project road as a 'Non-Sample Road' for development. This plan has contemplated that the project road would improve connectivity on the local as well as regional level, it would support sustainable development, facilitate in reducing poverty, and would improve access to the markets and social services for the resident population in the project districts.

1.4 IEE Boundaries

For purposes of establishing the baseline environmental condition, an overview of regional condition is presented followed by the description of prevailing environmental condition at the sub-project level if data is available. This IEE covers the entire length of the sub-project road.

Forimpact assessment, an envelope of 200 meters wide on each side of the project road over its entire length is identified as the primary impact area. This distance takes into account the common impacts associated with road works such as noise, dust and emissions. However, the project's primary impact area is adjusted depending on conditions on the ground. For road sections where sensitive receptors are present, such as schools, hospitals or other places where people congregate, the impact area is adjusted accordingly so that ample mitigation is formulated. For road sections that cross rivers, impact boundary is expanded depending on the possible extent of the significant adverse impacts.

1.5 Legal and Administrative Framework for Environmental Protection in Timor-Leste

The government's mandate to protect the environment emanates from the Constitution of the Democratic Republic of Timor-Leste. The Constitution of Timor-Leste stipulates that a healthy environment is a constitutional right and declares that:

1. *Everyone has the right to a humane, healthy, and ecologically balanced environment and the duty to protect it and improve it for the benefit of the future generations.*
2. *The State shall recognize the need to preserve and rationalize natural resources.*
3. *The State should promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy.(WB, 2009)*

1.5.1 Decree Law No 5/2011

To realize this constitutional mandate, the Government of Timor Leste has recently enacted its Law on Environmental Licensing, Decree Law No 5 / 2011, published in the Official Gazette Series I, No. 5, 9 February 2011. The decree promulgates the environmental licensing system to ensure that public and private development projects in Timor-Leste are implemented with due regard for the protection of the environment, socially acceptable and respectful of cultural traditions and practices. The law contains among others the following provisions:

- The procedure for scoping, the conduct of the environmental assessment, the review of application for environmental license, issuance and renewal of license.
- Categorization of the project according to severity of the environmental impacts (i.e. Category A, B and C)
- Procedures and information requirement for Category A projects (Environmental Impact Assessment) and Category B projects (Initial Environmental Examination)

- The review process for EIA and IEE documents, application for environmental license and the organization and composition of the review committee and its duties and responsibilities;
- Specific provisions for public consultation and the protection of the traditional customs and cultural practices, specifically the Impacts and Bargain Agreements (IBA) for projects required to submit EIA;
- The issuance of the decision by the Environment Authority on the review of the application and the rights of the project owner to appeal the decision;
- Classifications of environmental license, its duration and renewal; change of conditions of the license;
- The requirement for projects issued environmental license prior to the enactment of this decree-law to register with the Environmental Authority;
- The requirement for environmental monitoring, reporting obligations and duties of the license holder;
- The law also contains sanctions and penalties for violation of this decree.

1.5.2 Project categorization

Under the Decree-law No 5/2011, projects are classified according to 3 categories as follows:

a. Category A - includes projects that may potentially cause significant environmental impacts, and are subject to the procedure of Environmental Impact Assessment (EIA), this based on Impact Analysis and Environmental Management Plan (EMP) in accordance with the provisions in this law.

b. Category B - includes projects that may cause environmental impacts, and are subject to the procedure of Initial Environmental Examination (IEE), this based on the Environmental Management Plan in accordance with the provisions of the Decree Law.

c. Category C - includes projects where environmental impacts are negligible or nonexistent, and not subject to any procedure for Environmental Assessment in accordance with the provisions of this law

For categorization of this road rehabilitation sub-project, Guideline No 6 was referred to. Guideline No 6 states that upgrade of national road, regardless of the scale, belongs to Category B which requires the submission of an IEE and Environmental Management Plan (EMP). Based on this guideline, the rehabilitation and repair of the Dili-Tibar-Liquica road is Category B.

The GoTL's environmental classifications for environmental permitting requirements for road projects are listed in Table 1

Table 1 Environmental Classification of Road Projects in Timor-Leste

TYPE OF PROJECT	SCALE OF PROJECT	CATEGORY	DOCUMENTATION
Construction of national highways	All	A	EIA
Construction of rural roads (>15 km)	All	A	EIA
Upgrade of National Roads	All	B	EMP
Upgrade of rural roads	All	B	EMP
Construction of bridges	All	B	EMP

In compliance with Decree-Law No 5/2011, the prescribed Application form shall be submitted to the DoE for screening. The duly accomplished prescribed Application Form for environmental license is enclosed as **Attachment 1.**

The list of the other relevant legislations dealing with environmental and natural resource management with pertinent institutional responsibility is presented in **Attachment 2**.

1.5.3 Procedures for Processing and issuance of Environmental License

Presently, the Government of Timor has consigned the authority to enforce the environmental licensing function to the Directorate of Environment, under the Ministry of Economic Development.

The process for processing and issuance of environmental permit according to Decree-Law No 5/2011 is shown in Figure 1. The application for environmental permit starts with the submission of basic project data to the Environmental Authority for screening. It is during this stage that the requirement for environmental permit is determined. Category A projects are required to conduct an environmental impact assessment (EIA), while Category B projects are required to conduct an initial environmental examination (IEE). The processing of application for environmental permit by a Category A project is described in the following sections:

- Scoping

The Category A projects are then subjected to scoping to define the project coverage. To initiate this process, the proponent has to submit basic project information. The opinion on the environmental scope is issued by the Environmental Authority within 15 days of the receipt of the documentation.

- Conduct of the EIA and Submission of Application

Subsequently, the proponent prepares the EIA according to the determined scope and format prescribed in Decree-Law No 5/2011. The document is then submitted to the Environment Authority together with the duly accomplished application form for environmental permit.

- Evaluation and Approval

Upon receipt, the Environment Authority has 10 days to convene an Evaluation Committee. The Evaluation committee is composed of representatives of various government offices and it is their duty to evaluate and recommend the approval/denial of the application for environmental permit. As part of the evaluation process, a public consultation is conducted starting 10 days after the formation of the evaluation committee. The public has 24 days to submit to the Evaluation Committee comments, recommendations or proposals on the EIA and EMP.

The Evaluation Committee has 50 days, commencing 5 days after the organization of the Evaluation Committee to complete the technical evaluation and render a decision on the application. As part of the evaluation process the Evaluation Committee may ask the proponent, the affected communities, or government Ministries with interest in project additional information related to the application. The Evaluation Committee may also ask the Proponent to reformat, supply new information or analysis based on the outcome of the evaluation. During this time, the prescribed duration of the review of 50 days is suspended until the required information is received. According to Decree-Law No 5/2011, the Evaluation Committee has 10 days to review the additional information submitted by the proponent.

Upon completion of the technical evaluation, the Evaluation Committee prepares a report and recommends the approval or denial of the application for environmental permit. The recommendation is then submitted to the Superior Environmental Authority who issues the final approval and the order for the issuance of the environmental permit within 15 days of receipt of the Evaluation Committee report. For application that is denied, the process ends with the notification of the proponent of the decision.

Under ideal condition processing of environmental permit for Category A is about 90 days as prescribed in Decree-Law No 5/2011.

- Post Evaluation Requirement

A post evaluation requirement for Category A project is the Impacts Benefits Agreement, negotiation for which may commence once approval of the environmental permit is published.

For Category B projects, the processing of the application for environmental permit is much simpler than for Category A. The application for environmental permit is initiated by the submission of a document which contains the project information, the EMP and accompanied by the duly accomplished application form for granting of environmental permit.

The Environmental Authority has 30 days to complete the technical evaluation of the application. During this period, the Environmental Authority may require additional information from the proponent, the affected community or Ministries of the government with interest in the project. During this time the prescribed period of 30 days for technical evaluation is suspended until the receipt of the required additional information. The Environmental Authority has 10 days to review additional information. A public consultation may also be required as part of the evaluation process.

Upon completion of the evaluation, the Environmental Authority submits to the Superior Environmental Authority a recommendation, i.e. approval or denial of the application for environmental permit. The Superior Environmental Authority, within 10 days of receipt of the evaluation report, shall then issue an order for the issuance of the environmental permit.

For Category C projects, the Environmental Authority recommends that the project maintains an environmental management plan.

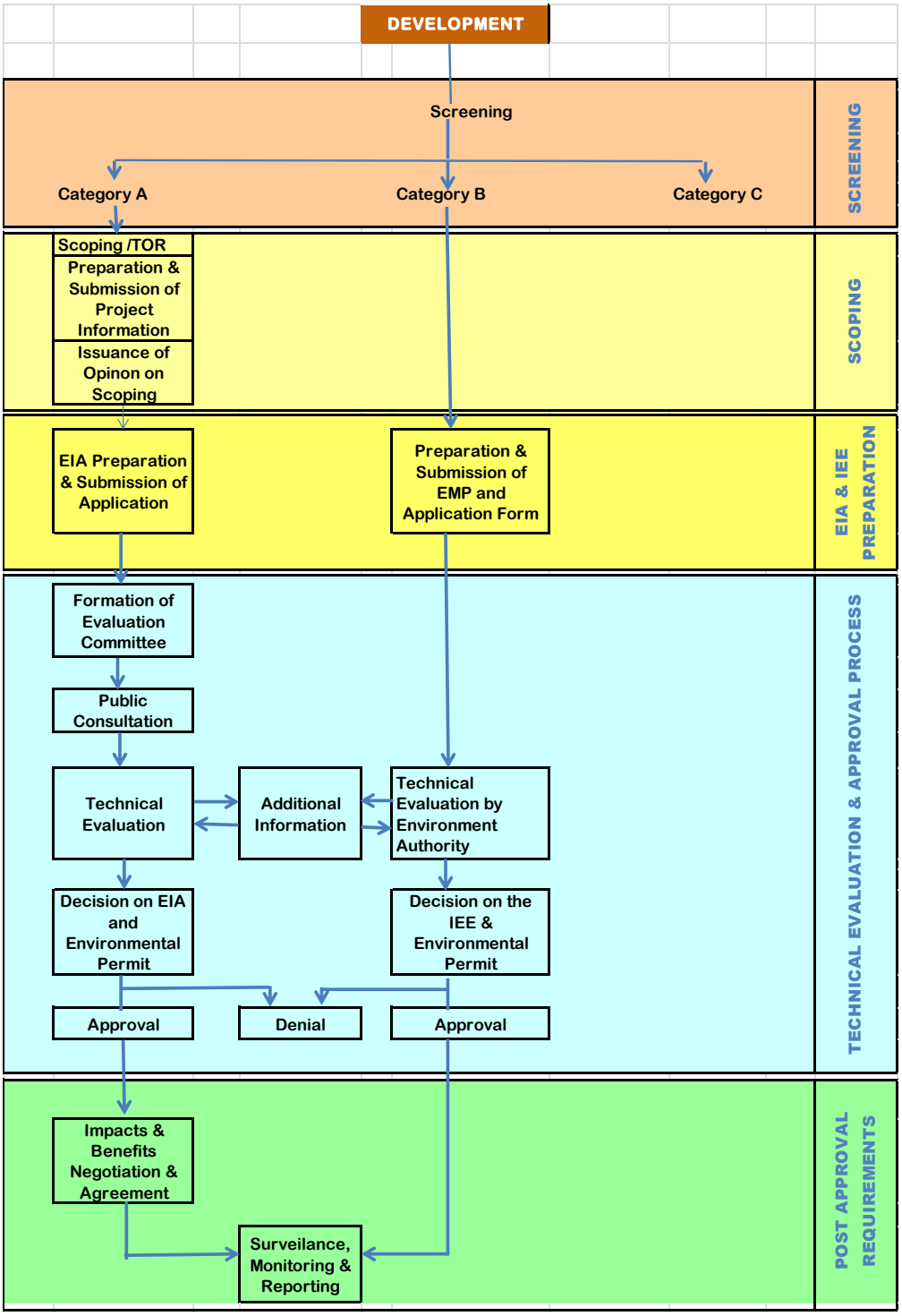


Figure 1 Review process for application for environmental permit in Timor-Leste

1.5.4 ADB Environmental Safeguards Policies

In as much as the project is being supported by ADB, the project has to subscribe to the Bank's environmental safeguards policies contained in the July 2009 Safeguard Policy Statement. The ADB's key safeguard areas are: (i) environmental safeguards, (ii) involuntary resettlement safeguards, and (iii) Indigenous Peoples safeguards. The environmental safeguard policy outlines the requirements that need to be complied with for projects supported by the Bank. Under the

environment safeguard policies, projects are required to undertake environmental assessment. These requirements include assessing impacts, planning and managing impact mitigations, preparing environmental assessment reports, disclosing information and undertaking consultation, establishing a grievance mechanism, and monitoring and reporting. Safeguard requirements for biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement, occupational and community health and safety, and conservation of physical cultural resources are also covered by the Bank's environment safeguard policies. The applicability of particular requirements is established through the environmental assessment process and compliance with the requirements is achieved through implementation of environmental management plans agreed to by ADB and the borrower/client.

Guidelines and procedures for complying with the environment safeguard policies, particularly environment impact assessment, are provided in a number of ADB publications.

The 2009 ADB SPS also contains the Screening and Categorization of projects depending on the significance of its environmental impacts associated with the project and location, the sensitivity, scale, nature and magnitude of its potential impacts. The screened projects are classified according to the following categories:

- Category A. Projects could have significant adverse environmental impacts. An environmental impact assessment (EIA) is required to address significant impacts.
- Category B. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- Category C. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- Category FI. Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

ADB will post the safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation: These documents are:

- For environmental category A projects, draft EIA report at least 120 days before Board consideration;
- Final or updated EIA and/or IEE upon receipt; and
- Environmental Monitoring Reports submitted by Implementing/Executing Agencies during project implementation upon receipt

1.6 Methodology Applied

This IEE is the progression of the 2009 environmental assessment done by the Ministry of Infrastructure under the feasibility study stage of this project. As such, this document has freely used the 2009 IEE as a reference for the preparation of this IEE with due acknowledgement.

Other reports that have been used as reference for updating the IEE include the Poverty and Social Impact Analysis prepared for the *Project Implementation and Support Consultants for the Road Network Development Sector Project – ADB Grant No. 0180-TIM' for the Tibar-Gleno Road (A04-01*).

The baseline environmental condition of the project site is compiled from previous IEE report, reports published in the worldwide web and observations made during the site inspection. References taken from the internet were screened for reliability and credibility of the sources of information.

The preliminary screening of potential environmental impacts of the proposed rehabilitation and repair of the roads included in the Roads Network Development Sector Project was done during the feasibility study stage wherein GIS analysis was carried out to determine roads impacts on

ecologically sensitive areas. In addition to this process, for this stage of the project, ADB's rapid environmental impact assessment checklist **(Attachment 2)** was utilized**.** For the prediction and assessment of site specific impacts, a 200 meter impact corridor on both sides of the road was delineated. This corridor was superimposed on the topographic map and satellite imagery so that land use, structures and other features can be identified.

2. DESCRIPTION OF THE PROJECT

2.1 Type of Project

This sub-project pertains to the strengthening, repair and bituminous resurfacing of the National Road from Tibar to Gleno (A04-01). This road alignment is one of the non-sample road links in Timor-Leste included in ADB Grant No. 180-TIM. The non-sample roads covered by ADB Grant no 0180-TIM are:

Table 2Timor Leste Roads Included in ADB Grant No. 180-TIMProject Implementation and Support Consultant (PISC)

	Link No.	From	To	Category	Length(km)
1.	A03-01	Dili	Tibar	National	7.2
2.	A03-02	Tibar	Liquica	National	21.4
3.	A04-01	Tibar	Gleno	National	31.9
4.	A04-02	Gleno	Ermera	National	11.5
5.	A19-01	Pante Macassar	Sakato	District	15.0
				Total	87.0

2.2 Project Category

2.2.1 ADB Guidelines

Based on the existing ADB Environmental Safeguards Policy (2009), this sub-project falls under ADB's project category B. This category is defined as "Projects with potential to cause less significant / fewer environmental impacts than Category A, yet still require a prescribed level of environmental management to protect the environment. For these projects an initial environmental examination (IEE) could be considered as final environmental assessment report if the stated document determines that an environmental impact assessment (EIA) is not required for the project under examination".

Considering the type and magnitude of activities and the absence of land acquisition and new road construction, no significant impacts that will warrant the conduct of an EIA are foreseen.

2.2.2 GoTL Environmental Regulation

The GoTL's law enforcing the environmental impact assessment is contained in Decree-Law No 5/2011. This decree-law defines the scope, categorization of projects according to environmental impacts, the procedure for securing environmental permit, the approval process and post approval requirements. In as much as secondary regulations supporting the Decree-Law No 5 are yet to be enacted, the existing relevant guideline, Guideline No 6 was referred, as advised by the DoE to define the category of this sub-project. As per Guideline No 6, upgrading of national roads, such as this sub-project, belongs to Category B. As a Category B, project it is required, under Decree-Law No 5/2011to submit an IEE with EMP for securing environmental permit.

2.3 Need for the Project

During the Indonesian regime the road received maintenance and some of the major bridges and cross drainage structures were constructed. But the civil unrest and struggle for independence resulted to severely damaged road condition particularly after 1999 elections. In post-independence years (post 2002) the road received basic emergency repair in its severely damaged sections to keep it traffic worthy. A decade or more of lack of strengthening and absence of bituminous overlay has left this vital road in very poor condition. The following table shows the present state of the national and district roads of the country.

General Surface Condition of the National and District Roads

Road Condition	National		District		Total	
Fair	122	9%	0	0%	122	8%
Poor	351	26%	9	4%	360	22%
VERY POOR	879	65%	249	96%	1,128	70%
Total	1,362		258		1,610	

Table 3 General surface condition of the National and District Roads (MoI 2009)

The sub-project road is part of the link between Timor-Leste and Indonesia at the western side of the island. This is an important trade link since it connects to the Indonesian part of the island, which is the source of international trade and freight movement by land route from Indonesia to Timor Leste and vice versa. In addition, this road provides access into the centre of coffee growing region of Timor-Leste. Coffee is the main export commodity of Timor-Leste (excluding natural gas & oil), and accounts for 75%-90% of all exports.

The Government of Timor-Leste has recognized the importance of developing physical infrastructure including road network as part of its program to reduce poverty in the country. With the realization that improvement of the road infrastructures will to contribute to economic growth and poverty reduction the Government of the Democratic Republic of Timor-Leste (the Government) has taken up the preparation of the Road Network Development Sector Project, with financial assistance from the ADB (Project TA 7100). The overall objective of this Project is to reduce vehicle operating costs, improve accessibility to market opportunities and economic and social services, as well as generate employment opportunities and income.

2.4 Location and Size of Operations

2.4.1 Location

National road A04-01starts in Tibar and coincides with end point of A03-01. The road runs on a southerly direction connecting Tibar, Gleno, Ermera and Maliana. It provides access to the prime coffee growing region of the country. It is also an alternate route connecting the capital Dili to the southwestern border post with Indonesia at Mota Ain.

Figure 2 Map showing the alignment of sample road A04-01

2.4.2 Proposed Solution

Pavement

The proposed improvements include the repair and restoration of the existing road, widening of the carriageway to 6 meters, providing 1-meter shoulders on both sides over most of its length, then providing a full asphalt concrete overlay. There are no proposed major changes in alignment or gradients. The repairs will bring the base course up to the pavement level in distressed areas and the full length of the road will then be overlaid with 50 millimeters of hot-laid asphalt. This will provide a high-quality road with a good riding surface.

In some sections where houses/structures are present and land is privately owned, the current road width (i.e. 0.75m shoulder and 5 to 6m asphalt pavement) shall be maintained

Figure 3 shows the typical cross sections of pavements in flat terrain and mountain terrain.

Drainage

The lack of routine maintenance is the main reason for the road drainage infrastructure to fall into disrepair. The basis of the drainage works design will be to repair the existing infrastructure and provide new works only where the present design is inadequate based on field conditions. Existing drains are to be cleaned or reconstructed where necessary. New construction may be required as part of the works.

Free discharge from culverts and bridges will be an important aspect of the drainage designs. The works will include, where necessary:

- building cascades to carry water away from the road formation and embankment;
- cleaning/clearing out streams of accumulated debris; and
- constructing weirs and drop structures to prevent further streambed scouring
- constructing river training walls to prevent scouring on banks

Culvert inlets which habitually become blocked will be cleared of debris or be reconstructed to improve the hydraulic capacity.

The changing drainage requirements resulting from the effects of anticipated climate change will be included in the design of the drainage facilities.

Retaining Structures

A detailed geotechnical investigation of the road was conducted as part of this study. The study found a number of locations where remedial action is required to stabilize geotechnical weaknesses affecting either the existing cut and fill batters or the integrity of the formation.

The types of earth retaining structures considered are:

- Gabion Walls

These are typically used to retain fill slopes. These will be placed typically to support the fill side of the formation on a slope. They can be used to remedy existing slope failures provided that they are suitably founded, i.e. in or on stable material.

- Stone Masonry Walls

These are typically used to retain back slopes on cuts that are prone to landslides and on embankment formations. The height varies from a minimum of 1.5m to a maximum of 5.0 meters. They can be constructed in conjunction with bioengineering works

- Breast Walls

These are similar to stone masonry walls but are generally shorter in height (1.5m high or less) and more commonly used to contain minor slips at the toe of the cut slope. These types of structure will be founded on stable soil or on compacted ground.

- Bioengineering

This technique covers a variety of specific treatments, all involving planting of selected vegetation to reduce slope erosion and water infiltration. It can be used to improve near surface stability over a wider area. It will typically be effective where stability problems are caused by low strength soils or rock rather than in steep terrain. Actual effects can be hard to quantify, however the probability of large scale failures will be reduced if the work is done correctly.

- Catch Drains

These are constructed to divert water away from areas or structures where it will cause stability problems. They are typically placed around the upper extremity of a slope, diverting water away from the slope. Normal table drains, culverts etc. should also be considered as an integral part of the water diversion.

- Check Dams

These are constructed to control the flow of surface water to reduce the velocity of the surface runoff and minimize erosion. They act as small weirs to dissipate the energy. They can be constructed of a variety of materials including bamboo and other plantings, stone and wooden palisades.

- Earthworks (Cut/Fill)

This refers to removing material from mountainsides and/or constructing embankments on the hill side to improve the stability of the formation. This would generally involve removal and disposal of material from landslide or excavation for the construction of lined ditches. This would also apply to design for new construction.

There are a number of areas in Timor-Leste that are geo-technically unstable and subject to regular landslides. It is not possible to prevent the land movement in these areas and hence there will be a recurring cost to reconstruct the road sections crossing these areas.

At many locations along the road, there is a substantial number of existing retaining walls which either support the cliff side of the road or support the cut slope of the road. The natural material is mostly strong and close enough to the surface to allow the construction of walls without excessive earthworks. Cut slopes along the road are prone to landslides through scouring and minor erosion. Such slopes will be reshaped and treatments will be applied to minimize future slips and eventual damage to the drains and road. Where considered viable, bioengineering will be applied to stabilize the slopes, and retaining walls (stone masonry wall or breast walls) will be constructed to prevent landslips.

Road Safety

The project's response to improving road safety outcomes is constrained by the general design approach. The design approach is to restore the condition of the road and widen the carriageway provide shoulders. Therefore the main road improvements provided by the project will be the condition of the roadway, the condition and width of the shoulders, provision of pavement marking, provision of road signs and conducting routine maintenance of the drainage systems. The main road safety benefits the project will deliver are the following:

1. reduced risk of vehicles leaving their lane to avoid potholes and surface deformations;
2. reduced risk of accidents due to road hazards, e.g. flooding of roadway, foreign objects (falling rocks) on roadway;
3. better information to drivers on infrastructure hazards;
4. improved sight distances due to improved vegetation control;
5. better separation between pedestrians and vehicles; and
6. better night driving conditions due to wider carriageway and improved pavement centerline markings.

Some of these advantages could be partially offset by the higher speeds which will be possible after the road improvements.

2.4.3 Project Implementation Schedule and Project Cost

This sub-project is planned to commence in second quarter of 2012 and is expected to be completed within 27 months of construction. The estimated cost of the repair and rehabilitation of the sub-project's total length of 31.9 Km and width of 6 m is estimated at US$27.31 million as of December 2011.

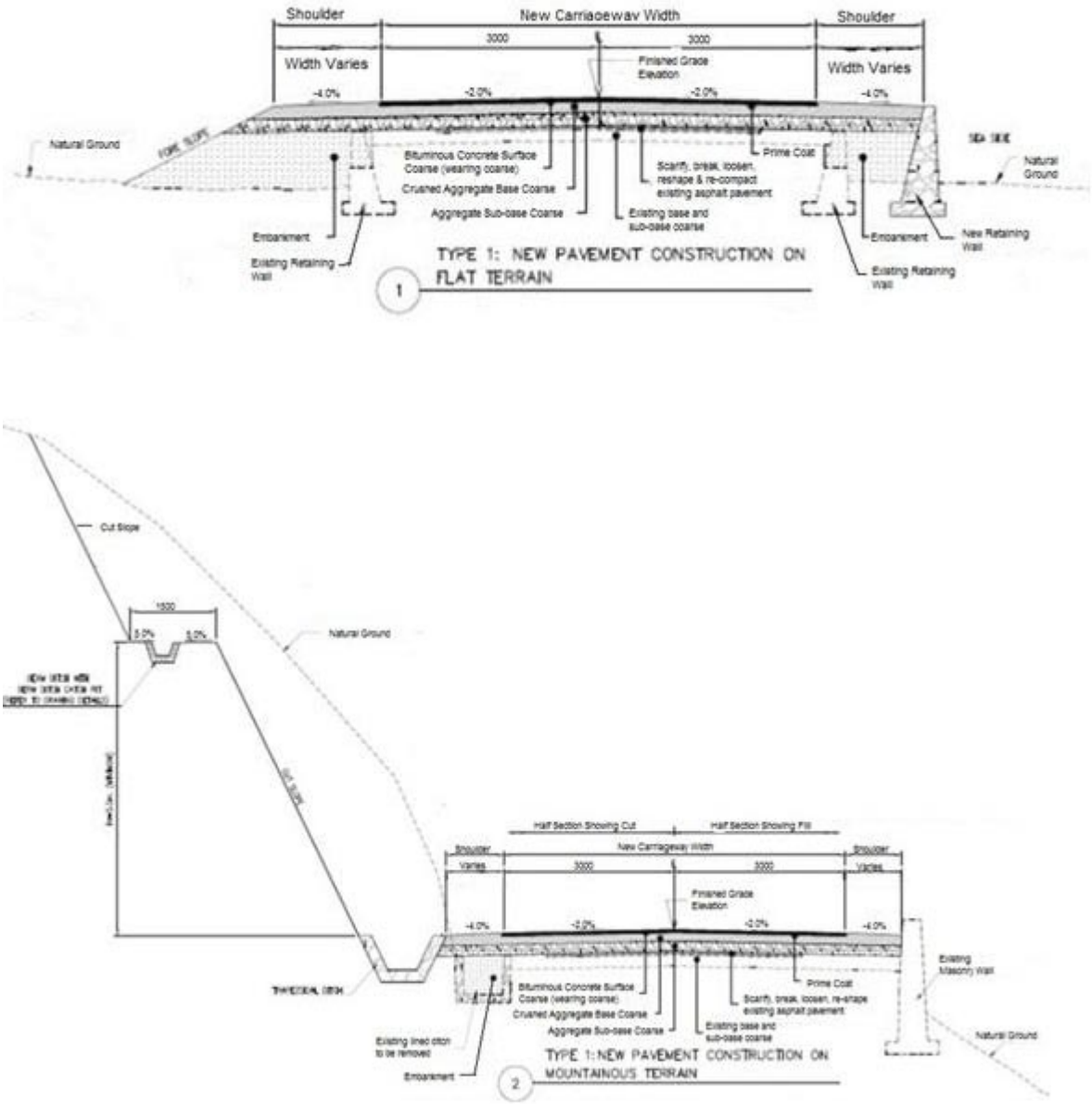


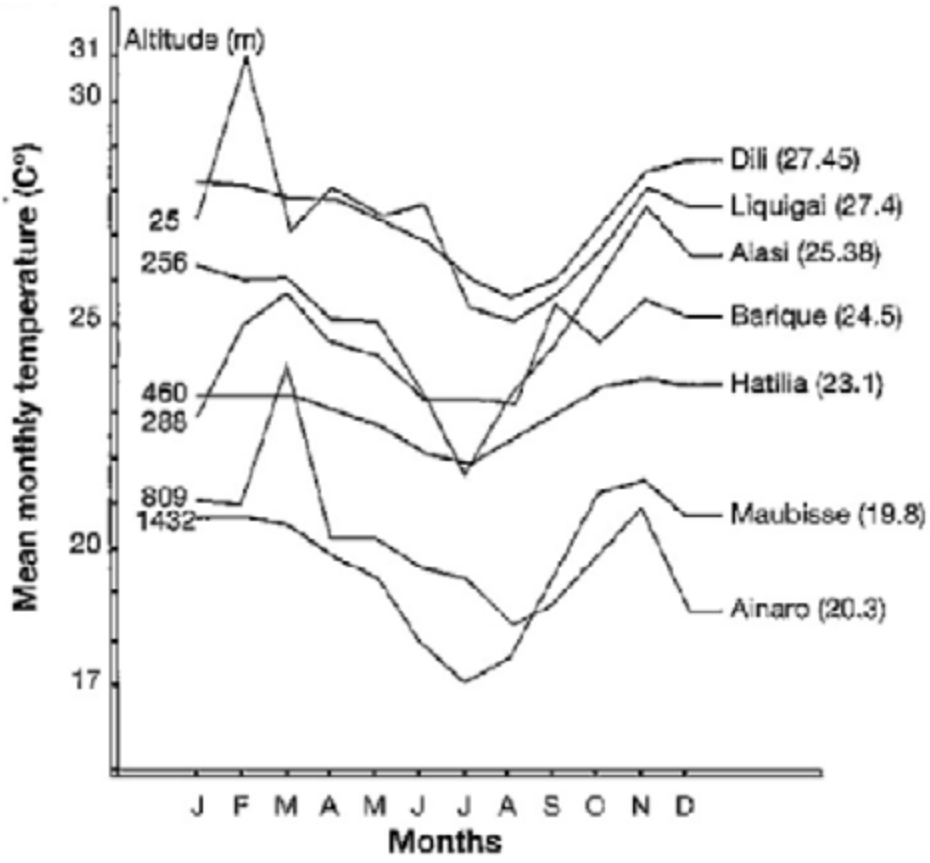
Figure 3 Typical cross section of the 2 types of new pavement construction in Flat Terrain and Mountainous Terrain

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Climate and Air Quality

Timor-Leste lies in the tropical region where temperature varies within a narrow range the whole year round. The average temperature in coastal areas is around 27°C in coastal areas and around 25°C in the highlands, including Gleno. But temperature fluctuation within the day can be larger than the monthly variation throughout the year.

Figure 4 Ambient Monthly Average Temperature in Timor Leste (after Kirono 2010)



The MOI (2009) IEE described the climate of Timor-Leste as hot and humid tropical, with large variations in rainfall and temperature over short distances due to the steep topography. Broadly speaking there are two annual seasons determined by the monsoon, which varies in length according to location, the monsoon lasting longer in the south than in the north. These climate patterns are described as follows:

- The Northern Monomodal rainfall produces rain during 4-6 months from December which affects a big part of North and the East.
- The Southern Bimodal rain pattern, which produces rain as long as 7-9 months with rapidly rainfall start in December and again in May, which is influencing the Southern part of Timor-Leste.

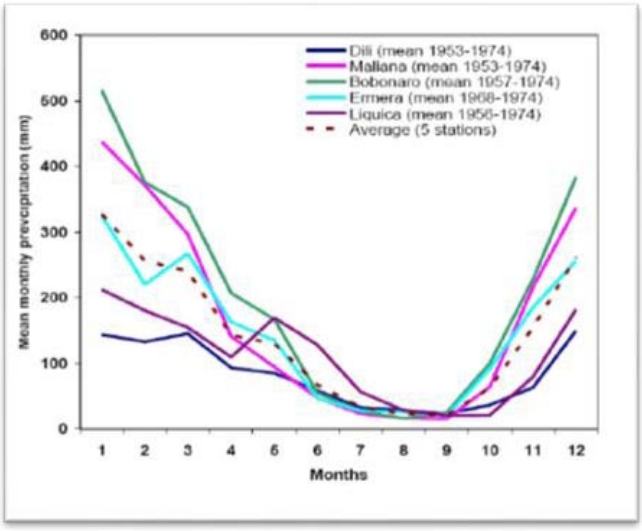


Figure 5 Monthly rainfall pattern of Timor Leste (after Dewi Kirono, 2010)

Given the rainfall pattern over the region of the sub-project, it is important that season be considered in the planning of the implementation of the repair and rehabilitation works particularly for areas susceptible to flooding and landslides.

The country is prone to tropical cyclones. The formation of tropical cyclones generally occurs within a band between 5° and 25° from the equator. Cyclones 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 (Figure 6) (Monk et al. 1997 cited in Kirono 2010). The tropical cyclone mean occurrence over the Timor-Leste region is around 0.2 per year (Abbs 2010 in Kirono 2010).

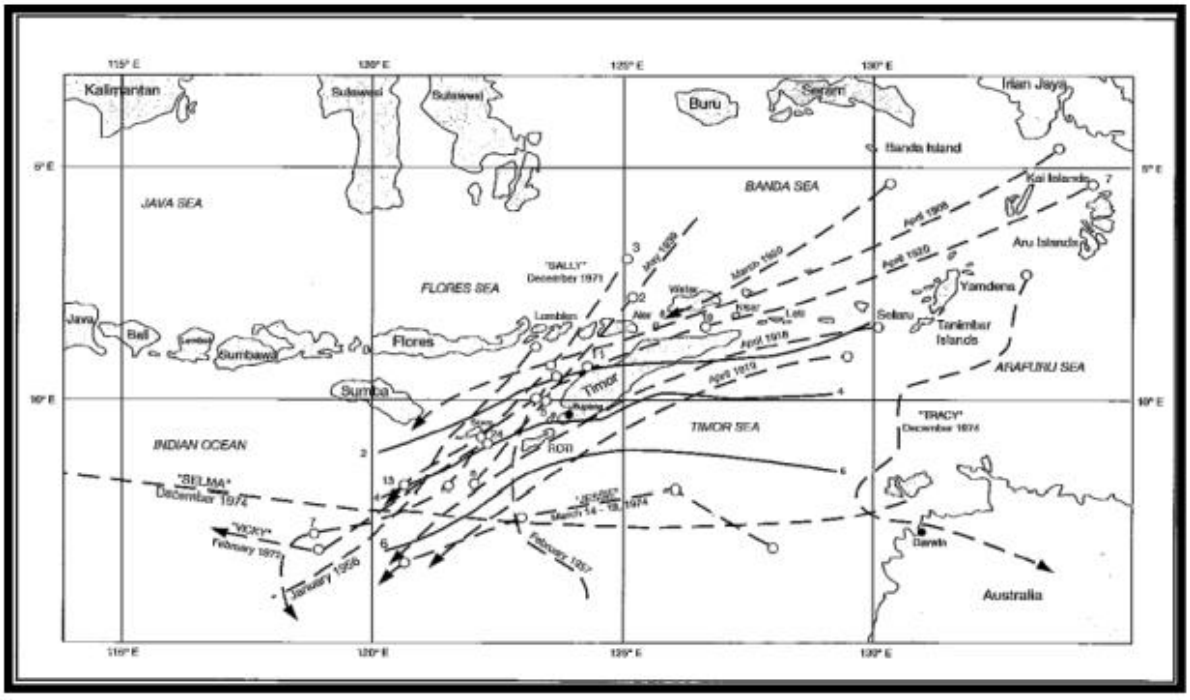


Figure 6 Occurrence of tropical cyclones in past over Timor Leste (Crippen International, cited in Kirono 2010)

In terms of ambient air quality, the WB's assessment (2009) of the outdoor air quality in Timor-Leste indicated said that air pollution is currently a minor problem. Ambient air quality concern is mainly limited to Dili.

Along the route of A04-01, the presence of burning in the open dump in Tibar is a possible source of air pollution. In addition, it is observed that fugitive dust and particulates are relatively high along the A04-01route. The prevalence of bare areas, dry soil, unpaved roads, lack of road maintenance and vehicular traffic all contribute to dusty condition along the road alignment.

3.2 Geology and Topography

The UNESCAP (2003) reported that Timor-Leste's landscape is dominated by mountain ranges estimated to cover about 1/3 of the country's land area. Among the prominent mountain ranges is the Ramelau Range with the highest peak elevation of 3,037 m asl represented by Foho Tatamailau. The rugged topography of the country is exemplified by the fact that more than 40% of the land has more than 40% slope (MOI, 2009). Fringing the mountainous terrain of Timor-Leste are coastal plains which taper and widen as it merge with floodplains and in-filled valleys.

The topography of the alignment of A04-01varies from flat to rolling from the coast to rugged and mountainous inland towards Railaco and Gleno. Maximum elevation of A04-01 is about 900 m as it approaches Gleno. The figure below shows the elevation profile of A04-01 based on Google Earth imagery.

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Figure 7 Elevation profile of A04-01 (from Google Earth)

It is interpreted from the topographic map that Gleno and Railaco are infill valleys built-up by active sediment deposition. These must have been previously deep depressions filled up by alluvial through active deposition. But it seems that active deposition must have been curtailed such that alluvial deposition and build-up of alluvial terraces did not progress downstream of Gleno. This is indicated by the lack of alluvial sediments in river channel of Gleno River as it merges with Loes River. These infill valleys are occupied by the population centers of Gleno and Railaco. Extensive rice paddies are also found in the alluvial terraces.

Road A04-01 is built over alluvial deposits in the valleys of Railaco and Gleno. But mostly, the road traverses the highly sheared and deformed Aileu Formation. This metamorphic formation called the Aileu Formation occurs widely in northern part of central Timor. It consists of a series of shales, phyllites, slates and occasional low-grade metamorphosed eruptive rocks. Interbeds of quartz-phyllites occasionally occur. This rock displays lustrous surfaces due to presence of chlorite and mica. This formation has been repeatedly exposed to deformation especially in the north coast. This deformation plus the pervasive presence of platy minerals like chlorite and mica structurally weakens the rock making it susceptible to landslide.

The inherent weakness of the rocks, the steep terrain and the occurrence of intense rainfall makes erosion and sedimentation as the most active geologic processes in Timor-Leste. Erosion and sedimentation in the country consist of the both the slow erosion-deposition (e.g. soil creep) and

rapid mass wasting processes which includes rock falls and landslides. The road cuts in several portion of the A04-01 are prone to landslides.

The other factor that contributes to soil erosion in the mountainous and hilly parts of the project area is grazing. Frequent grazing in the grassy slopes by ruminant animals hastens soil erosion as indicated by the presence of grazing step terracettes.

The very high sedimentation rate of the rivers in 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 of rivers like Loes. In Ermera, this is evidenced by the broad alluvial terraces of Railaco and Gleno noted along the route of A04-01.

River channel migration is another potential geologic hazard along the A04-01 route. It is noted that river channel migration is threatening to erode section of A04-01 at Km16+000 in Tibar. The other hazard of high sedimentation rate is river bed aggradation which reduces bankfull capacity and leads to overtopping, flooding and migration of river channel. Buildings, roads, farmlands and houses maybe buried in the process. The center of the sub-district of Gleno being built on the alluvial plain of Gleno River is prone to this hazard as indicated by the presence of river braiding.

3.3 Seismicity

Timor Island is prone to earthquakes being located in a tectonically active region, along the collision zone of the Australian plate and the Eurasian Plate. Compilation of major shallow earthquakes in Indonesia from 1897 to 1984 by the Southeast Asia Association of Seismology and Earthquake Engineering (SEASEE, 1985) showed a number of earthquakes (magnitude 6 to 6.9) with epicenters located offshore north of Timor Island. A magnitude 8 or greater has been recorded in 1963 with epicenter located offshore southwest of Timor Island. Recently, a very shallow (depth of 1.1 km) earthquake with magnitude of 5.6 and epicenter located on-shore south of Dili occurred last 26 April 2011.

3.4 Quarry Resources

No specific quarry sites have yet been identified for this sub-project. But the published report by UNESCAP on Geology and Mineral Resources of Timor-Leste has identified possible sources of construction materials in Liquica and Bobonaro. The quarry resources are andesite and gabbro. In other areas of Timor-Leste, limestone and is used as aggregate. Within the sub-project site, licensed quarries operate along the Tibar-Liquica road and in Hera, east of Dili. In addition, river bed quarry operations are also noted to be active along the route of the sub-project. However, since there are numerous factors that need to be considered, the contractor may opt for other sites. In which case, the contractor will have to secure the necessary permits, including environmental permit prior to start of work. Location of existing crushers and asphalt plants and other possible quarry sources within general area of sub-project roads are shown in following map.

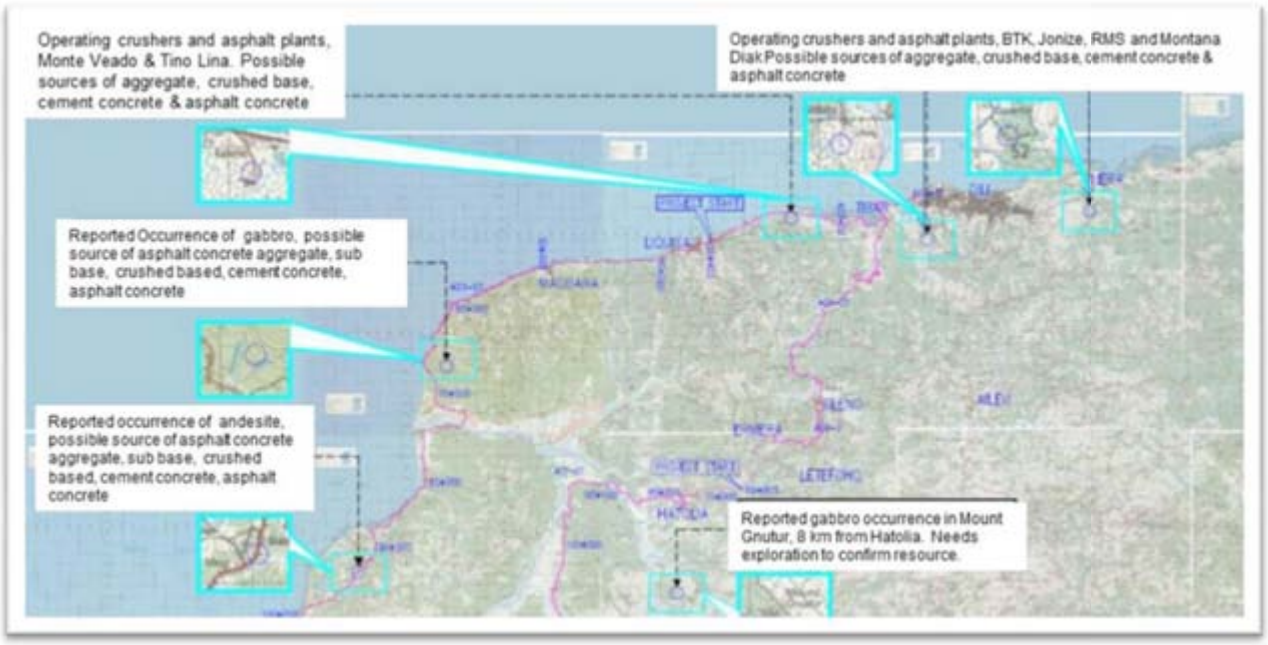

Figure 8 Locations of existing crushers and asphalt plants and other possible sources of quarry materials within the general area of the sub-project roads.

3.5 Water Resources

According to the 2009 IEE, rivers and springs are the main sources of water for domestic and agriculture. The major watershed of the country is formed by the Ramelau mountain and is the source of all major streams. The larger catchment areas and greater rainfall on the south coast permit the formation of more permanent streams here than on the north coast. The largest river systems in the country, the Laclo and the Loes) flow from the mountains to the north coast.

Two major rivers traversed by A04-01 are Gleno River and Angguo River. Gleno River is a tributary of Loes River, while Angguo River in Railaco is a tributary of Comoro River. These rivers are potential sources of water supply in addition to the springs. The following photographs show the water resources along the route of A04-01. Top left is Angguo River in Railaco, top right is Gleno River, bottom left is a community water supply tank of Railaco and bottom right is a small intermittent creek along the way.

Plate 1 Water resources along the A04-01 route (topleft Angguo River in Railaco, top right photo shows Boera River, bottom left is a water tank in Railaco and bottom right is a creek between Railaco and Gleno)

3.6 Flooding

Flooding is one of the recognized natural constraints in Timor-Leste especially in the floodplains and low-lying coastal plains. The Rihiu River in Tibar is among the floodprone areas identified by the 2008 District Atlas by UN Office for the Coordination of Human Affairs (OCHA) (see following figure)

Figure 9Flood prone areas, inset of Angguo River in Railaco, one of the identified flood prone areas

3.7 Terrestrial Ecosystem and Biodiversity

The land cover data of Timor-Leste gives an indication of its present ecologic condition. While statistics of existing land cover have yet to be reconciled, the land cover mapping done by ALGIS

in 2008 using remote sensing data showed that forest (various types of forests) is the dominant land cover of Timor-Leste. It is estimated that various types of forest covers 53.9% of Timor-Leste's land area, various types of cultivated land (agriculture) makes up about 28.7% and other land cover types, (including savannah, grassland, large towns and cities, bare, etc.) make up only 2%. Other researchers doubt the accuracy of this data believing that the forest cover is overestimated. It is believed that savannah formation is the predominant land cover in Timor-Leste. The predominant vegetation species of savannah formation is *Eucalyptus alba*.

According to the ALGIS GIS data, the land cover in the region of Tibar to Gleno is sparse moist lowland forest (see following figure). But at the project level, ocular inspection of the route of A04-02 showed that much of the land use has been influenced by human activities. The existing land uses along the route are described in the following section.

3.7.1 Ecologically Important Areas

An important bird area has been identified in the western side of Railaco (see following figure). The habitat must be a forest grading into the coffee plantations which are prevalent in the area. The coffee plantation can be easily identified because of the presence of tall mature shade trees like *Albizia falcataria*. The photographs in the following figure show the extent of the coffee plantations in this part of Timor-Leste.

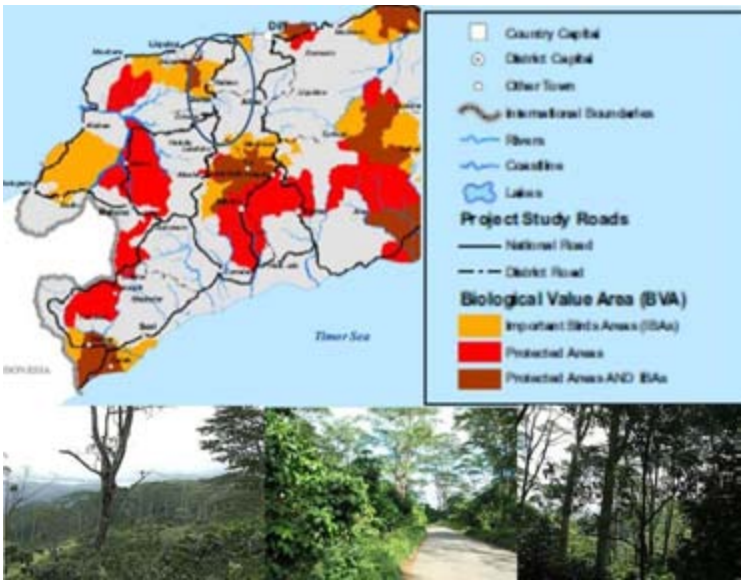

Figure 10 Biological value areas in the western side of Timor-Leste and photographs depicting the extent of coffee plantations as indicated by the presence of tall mature shade trees.

Wetlands – Mangroves

Mangroves, which appear to be remnant patches are found in along the coastline of Tibar, vicinity of the starting point. Portions of the mangroves have been cleared and converted to aquaculture ponds and salt beds. Deforestation of mangroves is likely partly due to requirement for firewood for salt production.

Coral Reef

Intertidal flats and fringing reefs are indicated to be present along the coastline of Tibar. The reef along the coastline of Liquica has been reported to be a scuba diving attraction. However there is no description of the general status of the coral reefs in this area.

3.8 Existing Land Use Along the A04-01

The land use along the corridor of A04-01 is a mixture of brushland, croplands and built-up which includes settlements and institution. The main built-up areas are the centers of Tibar, Railaco and Gleno. In Tibar (Km 15+000 to Km17+000), some institutional establishments like training centers, NGO offices are located along the route. The use changes as elevation increases. Coffee plantation becomes prevalent in elevations higher than 500 m, while rice paddies are confined to the alluvial terraces along the rivers of Angguo and Gleno.The photographs in the following figure show some of the land uses along the A04-01 route.

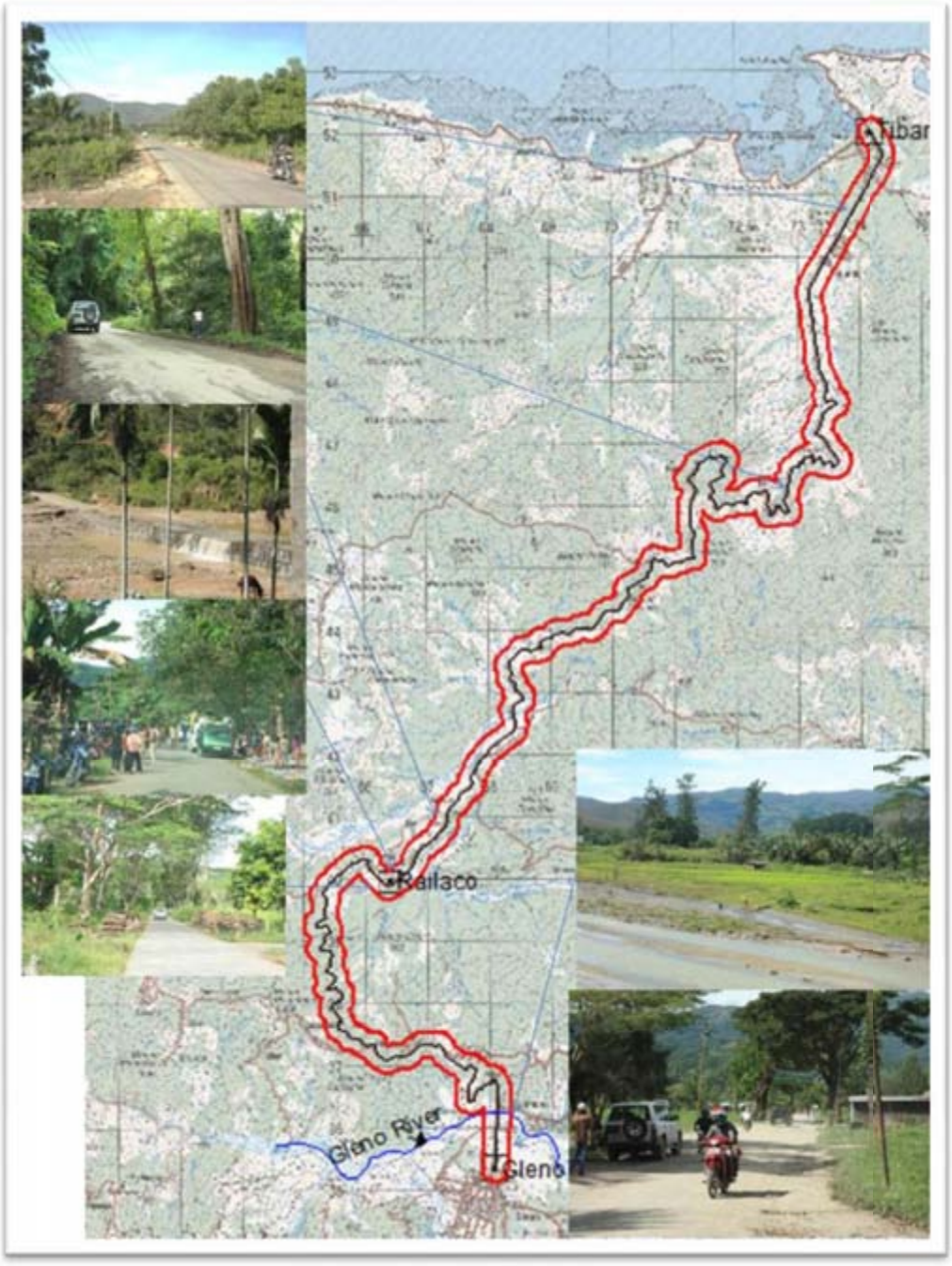

Figure 11 Alignment of A04-01 showing the 200 m primary impact areas and photographs of land uses within the 200 m impact area

3.9 Social Cultural and Economic Setting

3.9.1 Human & Economic Development

Population

In 2008, the population of Timor-Leste was estimated to be 1,080,742 (based on Census 2004 projection) with an annual population growth rate (2001-2004) of 5.3%. The median age was 18.3 years with a life expectancy at birth of 55.5 years, well below the average for East Asian and Pacific Island countries. On average seven children per woman are born, which presents a very high fertility rate (2004 census).

The population of the host districts, Ermera and Liquica as of the 2010 Census (NSD, 2010) is as follows:

Table 4 Population of the Ermera and Liquica District

District	Urban Population	Rural Population	Total Population
Ermera	8,133	106,502	114,635
Liquica	5,152	58,177	63,329

Table5 Population of the Districts of Liquica and Ermera based on 2010 census

Agricultural Development

Most of the beneficiaries in the project target area are rural subsistence farmers who obtain a small amount of income by selling cash crops such as coffee, vegetables and fruits. In the districts through which the project road is traversing about 78% of the population is engaged in the agriculture, fishing or forestry sector. Vendors along the project road are a common sight. Local resident trade their produce for cash with locals and the travelling public in make shift shelters or small market places built by the government. These markets are neither getting impacted by the planned activity for the project road nor do they pose any impact on the planned repair, restoration and bituminous overlay of the project road. The agricultural development is weak due to absolute dependence on monsoons, an inequitable land tenure system, lack of educated/trained farm workers and training for farmers.

Liquica and Ermera are part of the coffee growing region of Timor-Leste. Coffee is considered as the primary cash crops and a major export product of the country. Ermera is the top coffee growing district of the country with over 34,900 hectares of coffee plantation producing 71% of the country's total production. In Liquica, coffee plantation occupies 6022 hectares t, making it the fourth largest coffee producing district of the country with an estimated annual production of 1,000 tons or 14%of the country's total production. But production drastically declined in 2000, with production only from 3894 has. This is attributed to a number of problems (Office of Local Government and Development, District of Liquica, 2002). ,

Industrial Development

There are no major industries in the project impact area or its vicinity. Small size of domestic market, low purchasing power of the local population, relatively high wages compared to Indonesia, and high transport costs are constraints to industrial development.

Infrastructure

The physical infrastructure of Timor-Leste is in most areas insufficient to support adequate economic and social development. In late 1999, about 70% of the physical and economic infrastructure of Timor Leste was laid waste by Indonesian troops and anti-independence militias, and 260,000 people fled westward. Over the next three years, a massive international program, manned by 5,000 peacekeepers (8,000 at peak) and 1,300 police officers, led to substantial reconstruction in both urban and rural areas. By mid-2002, all but about 50,000 of the refugees had returned and remaining 210, 000 preferred to live in Indonesia or went to other countries. Growth, however, was held back in 2003 by extensive drought and the gradual winding down of the international presence.

Currently the country is facing great challenges in rebuilding its infrastructure, strengthening its civil administration, and generating jobs for young people. The road infrastructure is a constraint for the delivery of agricultural products to the main markets. There is as yet little infrastructure to support tourism and virtually there is no industry in the country. Since roads provide the dominant form of transportation, the lack of a serviceable road infrastructure contributes significantly to the incidence of poverty.

It reported that Liquica town is supplied by eight intakes (seasonal streams); one spring and two deep boreholes resulting from JICA participation in the rehabilitation of water supply in the city in2001. Four bore holes, the most sustainable water source, have been destroyed during the1999 violence. Accordingly, the water supply amount is reduced to about forty per cent of the total demand (Office of the Local Government and Development, Liquica District 2002http://www.estatal.gov.tl/Documents/District%20Development%20Plans%20and%20Profiles/Liquica/Liquica%20District%20Profile%202002_eng.pdf).

In Ermera, water supply is from springs. Spring boxes collect the water for conveyance into storage tanks. From the tank, water is piped to the communities.

Ethnic and Cultural Diversity

In Timor-Leste, ethnic association is associated with language. There are 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). 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.

Poverty Levels

Timor-Leste is one of the poorest countries in the world. Currently, it is estimated that 88 percent of Timor-Leste's population is poor, and 46 percent are very poor. More than 40% of the population is reported to live below the national poverty line of $ 0.55 per day. The electrification ratio for all households is only 20%, in rural areas, 95 % of the households are without electricity. About 48% of the population does not have access to safe drinking water supply, and 69% does not have access to adequate sanitation facilities.

It has been envisaged that the improvement of the project road would benefit approximately about 58,000 persons. Indirectly, the population affected could be much larger, since the project road eventually leads to the capital Dili.

3.9.2 Education and Health

Based on the 2004 census, 54% of the population is illiterate, among the 15-24 year olds illiteracy climbs up to 73%. Currently, about a third of children are not enrolled in primary school and about 20% of the enrolled children do not attend classes. Access to health care and medical services is flimsy. Only 27% of all births in the country are attended by skilled health care personnel. Infant mortality (per 1,000 live births) is 98; Under Five mortality (per 1,000 births) is 136. Malnutrition is a

serious problem for children under five years of age. The ratio of a qualified medical doctor is less than 1 in 1000.

In terms of education, Ermera as of 2002 has 64 primary schools and 9 secondary schools (2 senior high schools and 7 junior high schools. Liquica District as a whole on the other hand has a total of 46 schools, a total of 55 secondary school teachers and a total of 1634 secondary school students. The number of schools must have increased by now due to the rehabilitation efforts done after 2002.

3.9.3 Land Tenure

About 25% of the land tenure out of 200,000 land parcels in the country is formally registered. The vast majority of land parcels have been held by traditional landowners, mostly communities defined as 'origin groups' (equivalent to indigenous people in other countries). 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. There are specific laws and guidelines concerning details of land acquisition and compensation.

While studying the legal system of the country it has been noted that the legal foundation for the right-of-way (ROW) for roads has not been established in Timor-Leste. When road works require additional land, the GoTL negotiates with the owners or users on case-to-case basis. According to usual practice, when land acquisition is required for project development, concerned parties under the direction of the local authorities will negotiate and reach an agreement on compensation rates, total compensation amount, and the procedures or mechanism for compensation and transfer. A preliminary draft of a new land law is currently on limited circulation within the Government.

There are sparsely located habitation, settlements, fishing hamlets and villages along the project road. In settlement areas the houses are located very close to the project road, but appear to be out of the right of way (which is yet to defined). Encroachments onto the right of way are not common. Overall it is more common to see gardens placed between the Project roads and the houses.

3.9.4 Archaeological, Historical and Cultural Sites

No official record or listing existing in Timor Leste, containing the official listing of historical and archaeological sites. However the government has plans to undertake a survey of archaeological, historical and cultural sites. As far as can be determined, there are no cultural sites along the route of A04-01.

4. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

This impact assessment and mitigating measures covers the entire cycle of the sub-project, from pre-construction to construction and operation and maintenance. The coverage of each of this sub-project phases is defined as follows:

- ***Design-Preconstruction Phase****,* the period before the actual construction starts (section 4.4.2). Certain safeguard requirements need to be complied with in order to allow the Contractor to implement the project.
- ***Construction Phase***, the period from the time that the '*Notice to Proceed*' is given to the Contractor until the issuing of the '*Certificate of Completion*',
- ***Operation and Maintenance Phase***, the period starting with the issuing of the '*Certificate of Completion*' issued by the DOW until the end of the 20-years life time of the subproject.

The initial overall screening of the road improvement project as a whole was done by the MoI in 2009. The MoI (2009) analysis was GIS assisted wherein several thematic layers (e.g. biologic, geologic, topographic, etc) were overlay to identify environmentally sensitive areas. The environmentally sensitive areas were delineated through a scoring system. The proposed roadworks, (in terms of its magnitude based on type of work, its spatial extent and temporal nature, i.e. duration) were then superimposed on the environmentally sensitive thematic map to predict and assess the potential impacts. The outcome of this screening is also used in assessing the potential impacts of this road sub-project.

The key feature of the project that mitigates the overall adverse impact is the fact that the project will be confined within the existing road alignment and that existing ROW can accommodate the proposed carriageway widening. Work will consist of widening of carriageway, repair of pavement, shoulder, drainage and slope stabilization. Given these types of works, activities in any particular section of the sub-project shall be of short duration. Thus, the prescribed planned road improvement activities described are considered negligible, small or intermediate.

In addition, specific to this sub-project, the screening of the potential impacts was done using the ADB's rapid environment assessment checklist. Subsequently, the review of the existing condition prevailing along the alignment allowed the identification at a detailed level, the sensitive receptors such as important ecologic features and the location of human settlements. These areas within the sub-project alignment shall be given special attention with respect to environmental management.

4.1 Possible Impacts Based on Location

The identification of the potential impacts based on project location is best appreciated by superimposing the 200 meter impact envelope over the map of the sub-project road and the general land covers along the road alignment **Figure 9.** It can be gleaned from the said figure that the 200 meter impact area encloses the built-up and populated areas of Tibar, Railaco, Gleno and some suco's along the route. Schools are located within these settlements and as noted during the field surveys. School children make up a large proportion of the pedestrians using the road. Coffee plantations (southwards of Km26+000) and rice fields are likewise within the 200 m primary impact area in Railaco and Gleno. As observed during the survey, coffee plants are often present right next to the road, especially in the sloping areas.

Based on the foregoing, possible impact receptors and items susceptible to impacts of the sub-project are settlements, community facilities (e.g. water supply) and farmlands. It is observed during the site inspection that some form of environmental degradation is present, particularly the presence of dust along the road and the siltation of rivers due to ground disturbance caused by vehicles crossing the river bed (Railaco). The dusty condition along the route is brought about by the presence of bare areas, unpaved roads, and very dry condition. The contribution of the sub-project to the existing level of fugitive dust will not be significant relative to the present condition.

The impact of the construction to the important bird area in Railaco is anticipated to be insignificant because of the presence of a strip of cultivated and settlements between the road and the forested area. The coffee plantations along the road are constantly disturbed during harvesting and

maintenance of the plantations, thus, impacts of the construction which is temporary and of short duration is not expected to be important. The possible source of significant impact to the forested area during construction is encroachment by construction workers for collecting food and fuel wood.

Agricultural lands, particularly those located along the sub-project road are prone to impacts of construction. These impacts may include accidental smothering and burial of crops by construction materials, loosened soil and rocks during slope trimming and shoulder repair, accidental trampling of planted crops by workers and construction equipment and vehicles.

The possible impacts on coastal and marine resources in the Tibar section of the sub-project are considered low since the sub-project extends inland and away from the coastline.

4.2 Possible Impacts Due to Design

The proposed work on the A04-01 will include widening of carriageway to 6 m and provision of shoulders, improvement of drainage and slope stabilization within the existing road alignment. The sub-project will not entail realignment and existing grade will be maintained. As such, the sub-project minimizes land acquisition and therefore minimizing the resettlement impacts. But it is anticipated that slope trimming will affect coffee plantations starting at about Km25+000. Damage to coffee and other crops will be compensated.

4.3 Possible Impacts Due to Construction Activities

4.3.1 Impacts on Air Quality

Impact on air pollution along the sub-project alignment will be due to fugitive dust and operations of construction equipment. But these impacts are not considered significant considering the short duration and temporary nature of the work. More importantly, work is limited to repair and rehabilitation along existing alignment. However, fugitive dust can cause nuisance to people residing within the 200 m corridor on both sides of the roads.

Table 6 Location of settlements along the A04-01 alignment

	Station / Chainage	Receptors
1	Km14+000 to Km18+000	Tibar, at the start of the sub-project, residentials and institutions
2	Km20+000 to Km 20+500	residences
3	Km21+140	Residences
4	Km22+44 to Km23+095	Residences
5	Km26+154 to Km26+345	Residences
6	Km27+680 to Km28+000	Residences
7	Km31+400 to Km31+750	Residences in Railaco
8	Km33+500 to Km36+320	Mixed built-up of residences + commercial+industrial+institutional
9	Km 42+650	Residences – Gleno sub-district
10	Km45+425 to end	Gleno sub-district, mixed commercial residential+institutional

4.3.2 Impacts on Noise

Noise during the rehabilitation work will mostly come from the operations of construction equipment. Typical noise signatures of the different equipment for different construction activities are enumerated below. The noise levels are dependent on the model and the maintenance status of the equipment. This impact is a concern in the built-up sections of Tibar, Railaco and Gleno (see Table 6) and other sections where settlements / dwellings are located on the roadside.

Site Clearing		**Excavation & Earth Moving**		**Structure Construction**	
Equipment	Noise Level	Equipment	Noise Level	Equipment	Noise Level
Bulldozer	80	Bulldozer	80	Pneumatic tool	81-98
Front end Loader	72-80	Backhoe	72-93	Crane	75-77
Dump Truck	83-94	Dump Truck	83-94	Welding Machine	71-82

Site Clearing		Excavation & Earth Moving		Structure Construction	
Grading & Compacting		Jack Hammer	80-93	Concrete Mixer	74-88
Grader	80-93	Landscaping & Clean Up		Concrete Pump	81-84
Roller	73-75	Bulldozer	80	Concrete Vibrator	76
Paving		Excavator	72-93	Air compressor	74-87
Paver	86-88	Truck	83-94	Bulldozer	80
Truck	83-94	Paver	86-88	Cement and dump trucks	83-94
Tamper	74-77				

Table 7 Typical noise signatures of construction equipment

The impact of construction on residents could be range from moderate to high depending on the the density of residences along the road alignment.

4.3.3 Impacts on Geology and Topography

The proposed rehabilitation works may have some impacts on slope stability, particularly during slope stabilization work. Trimming of the slopes will hasten erosion and downslope movement of unstable materials. This can cause smothering of vegetation including coffee plants located downslope and can introduce unstable talus material which can be easily eroded to the waterways. The magnitude of this impact is moderate to high considering the length of the road section where slope trimming will be done (i.e. Km19+000 to Km 45+000).Without intervention, this impact can cause substantial damage to coffee plantations and can linger until slope has naturally stabilized by vegetation growth or attrition. An example of slope trimming and slope stabilization in one the sections of A04-01 (Km20+400) is shown in the following figure.

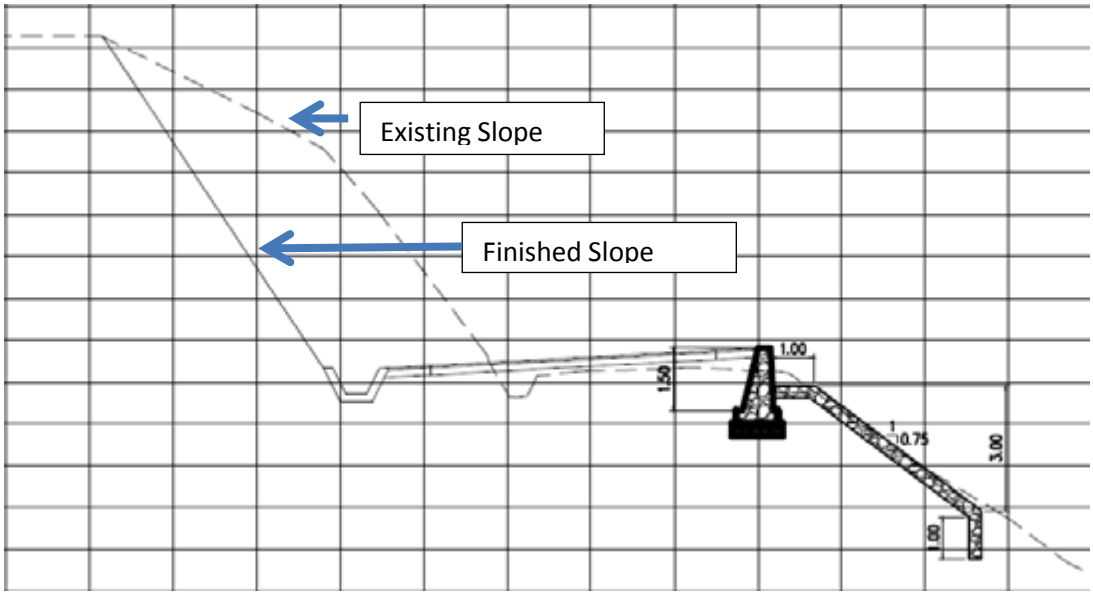

Figure 12Example of Slope trimming and slope stabilization work (Section Km20+400)

4.3.4 Impacts on Water Resources

The repair and rehabilitation of A04-01can affect water resources in two ways. One is disruption of community water supply systems and the other is degradation of water quality of river water due to siltation. Because of the importance of water supply, this impact is rated to range from moderate to high. The concern on possible damage to water supply system was in fact voiced out during the consultation by the representative of the rural water supply and sanitation officer of the District of Ermera. The water supply structures within the 200 m primary impact areas that are prone to

impacts are pipeline and storage tanks. This is of particular concern in the Railaco and Gleno where pipes and water tanks are located along the road.

Another potential impact of construction activities is increased siltation and the contamination of surface water bodies such as Rihiu River, Angguo R / Boera R, Gleno R and the small tributaries by oil, grease and fuel.

Finally, the construction may compete with communities for water supply if it will draw water from the community's water source.

4.3.5 Impacts on Social, Cultural and Economics

In as much as the project is rehabilitation of the existing road only, it does not have the social, economic and community life concerns that are associated with new road construction this road improvement project is generally aimed at bringing benefits to surrounding communities through lower transport costs and better access to market places, jobs, and services such as health and education. Road construction and rehabilitation projects can lead to changes in the community or social environment around the road, influencing various aspects of lifestyles, travel patterns, social and economic activities.

- Temporary Employment

The community along the alignment of sub-project will have opportunities for temporary employment during construction. Although this opportunity is temporary in nature, this will still be beneficial for Liquica and Ermera Districts. But efforts will have to be made so that this positive benefit can be enhanced. Labour force maybe available but may not have the skills necessary for construction, thus, programs need to be emplaced to train these people. Also, the residents of the sub-project area should have priority in employment as stressed by participants during the consultation.

On the other hand, temporary employment opportunities offered by the sub-project may divert part of the labour force from agriculture. This could be a concern in Liquica where unemployment rate is very low (0.3%).

- Loss of productive coffee crops

The road rehabilitation will likely lead to loss of some productive coffee crops along the road. The potential loss has surveyed. Please refer to the resettlement action plan report for the assessment of possible loss as well as compensation plan. The section of the road where this impact is expected is from Km26+000 (elevation 500m asl and greater where coffee is generally grown).

- HIV/AIDS

Among the possible adverse socio-cultural impacts of the project are increased alcohol consumption and risk of exposure to STIs and HIV have been identified.

The risk of spread of STIs and HIV associated with the project is a function of a number of factors including (i) existing knowledge about the risk; (ii) the length of time large and relatively mobile populations will be located in the subproject areas; (iii) engagement in high-risk behaviours (such as increased alcohol consumption and multiple partners etc); and, (iv) improved access and mobility especially that associated with cross-border travel. The knowledge surrounding routes of transmission and prevention of STIs and HIV in the beneficiary population is low.

- Trafficking

The project is further prone to human trafficking and children exploitation. During project construction there will be opportunities to target those most vulnerable to trafficking with benefits such as job opportunities with construction work. In addition, women and children are vulnerable to being trafficked from rural areas or from camps for internally displaced persons to Dili with lures of

employment and then forced into commercial sexual exploitation. Mitigating these risks include: i) Assessment of the how project activities could affect migration patterns and provide opportunities for traffickers to become active in the area; ii) The incorporation of awareness messages into Project components already addressing community impact issues, and codes of conduct for construction workers that raise concerns about service/sex workers and child prostitution can also be a means to address some trafficking issues; and iii) Awareness messages for service/sex workers and construction workers can be combined with anti-trafficking and safe migration messages.

- Impacts on Cultural and Heritage Resources

The impacts on cultural and historical resources are yet unknown.

4.3.6 Impacts on Public and Occupational Health and safety

Public Health and Safety

Potential impacts on public health and safety can include traffic hazards due to partial closure of roads, pedestrian safety in construction sites where they are prone to different hazards due to exposure to operating construction equipment and moving vehicles. The travelling public may also be inconvenienced by delays due to road closure and route diversion in construction sites. Most vulnerable to these hazards are students who make up a sizeable proportion of the pedestrians during schooldays as noted during the field survey.

Occupational Safety

Workers will be exposed to hazards associated with construction. Among these are exposure to moving equipment and vehicles, heavy lifting, construction noise and others.

4.3.7 Impacts Due to Disposal of Solid Wastes

Improper disposal of solid wastes can cause environmental health hazards. As gathered from residents who were interviewed, there is no waste disposal facility in Gleno. The only government waste disposal facility is the one in Tibar, at the starting point of A04-01. Thus, waste disposal can be a concern to the sub-project implementation if no solid waste management plan is put in place. The contractor has little option but to haul and dispose residual waste in the Tibar waste disposal facility.

4.3.8 Post Construction Impacts

Clean up during post construction period should be done prior to Contractor's abandonment of construction site, stockpiles area, borrow site, construction camp and others. Wastes, disabled equipment, stockpiles should be removed and bare areas and contaminated sites should be rehabilitated.

4.4 Impacts Due to Operations

The communities along A04-01 stand to gain important benefits from the improvement of the road. It is anticipated that it will improve access to schools, health services and other public services which are commonly served from the main population centers. However, opinion of some residents gathered during the public consultation is that the improvement of A04-01 will not result to expansion of coffee plantations. They cited that improvement of rural roads is what is needed to stimulate expansion of coffee plantations.

The predicted main adverse impact of the sub-project when completed is public safety. Once the road is improved, vehicles can travel much faster and disregard for traffic safety rules by local drivers can result to traffic accidents. This will expose communities traversed by the sub-project road to traffic hazards. Driver education and enhanced road safety awareness should be a parallel program of the government in its effort to improve transport.

No significant impact is expected from routine maintenance. Routine maintenance for roads such as A04-01 will entail activities such as grading, grass cutting, drain clearing, pothole patching and shoulder repairs, which are performed at regular intervals. Periodic maintenance activities are typically scheduled over periods of several years and include resurfacing and bridge repairs. Other maintenance activities considered to be periodic include seasonal maintenance, such flood repairs, emergency maintenance to reinstate roads after major failures, and the regular upkeep of safety features and road signs.

4.5 Mitigating Measure

4.5.1 Impacts Due to Project Location

Impacts on Biologically Important Areas

Mitigating measures to minimize impacts on biologically important areas should include guidelines and restrictions for construction workers with respect to collection of wildlife and encroachment into the forest.

Impacts on Agriculture

The following measures are should be adopted during construction to minimize the impacts of construction on agricultural crops particularly in sections southwards of Km26+000 and in the rice fields of Railaco and Gleno:

- For seasonal crops, timing of construction or temporary occupation of agricultural land after harvest;
- Stockpiles and equipment yard should be located in flat areas away from productive agricultural lands;
- Extent of construction area should be clearly marked on the ground to guide equipment operators and workers;
- For construction works that will directly affect farmlands, a prior agreement with landowner should be secured by the contractor;
- For earth moving works (e.g. slope trimming) in sloping areas, silt fences and brush dams should be installed to prevent damage to crops located downslope;
- Damage to crops should be fairly compensated, contractor should immediately restore affected farmlands.

4.5.1 Mitigation of Impacts During Construction

Impacts on Air Quality – Dust

To protect the residents, the Contractors shall observe and apply the following dust suppression methods in areas mentioned in **Table 6**:

- Spray water on exposed surfaces during dry periods
- Wet quarry loads or road fill loads being carried in open trucks
- Construction materials and spoils shall be covered when being transported.
- Siting of stockpiles area and asphalt mix plant away from residential area.
- Borrow sites and bare areas shall be rehabilitated as soon as possible
- In case of unpaved roads near settlements, speed limit shall be imposed on haulers and other vehicles of Contractors

Impacts on Community Noise

Noise associated with construction can be mitigated in a number of ways. The following table presents the measures to mitigate construction noise as well protect workers from occupational hazards of noise.

Table 8 Noise Mitigation Measures

Means of Reducing Noise	Specific examples
Substitute process or equipment with one with lower noise levels	Use of new equipment, well maintained equipment, e.g. new power generators; use of vibratory or hydraulic pile driver
Eliminate or minimize noise at source	Install mufflers; retrofit old equipment; operate equipment according to manufacturer's specifications; damp noisy or vibrating parts, equipment; maintain equipment properly
Increase distance between source and receptor	Doubling distance from source reduces noise by as much as 6dB, depending on site condition, e.g. soft or hard ground
Timing of Activities	Construction /operations of heavy equipment should be limited to daylight hours.
Isolate or enclose process or operator	Use noise enclosures, noise barriers; minimize leaks in barriers; use of equipment with operator enclosures / cab; Noise enclosures should have density of $10kg/m^2$
Change work practices	Limit time of use of noisy equipment; rotate use among workers; provide breaks from noisy work place; turn off equipment when not in use; For public protection, avoid operating at night.
Promote occupational health and safety in work places	Hold OHS briefing regularly and provide PPEs;

Equipment that will be deployed to the project shall be inspected to ensure that these are fitted with noise mufflers and are properly maintained. Equipment shall be tested for noise prior to deployment.

Impacts on Geology - Erosion and Sedimentation

- Reduce the time surfaces remain bare.
- Keep vegetation clearing to a minimum.
- Minimize disturbance on steep slopes.
- Keep vehicles on defined tracks.
- Construct necessary temporary/permanent control structures.
- Strictly enforce disposal of surplus material at designated, environmentally safe disposal/fill sites.
- Re-vegetate bare slopes after construction by applying bioengineering solutions where appropriate.
- Rehabilitation of landslide sites and areas with obvious erosion problems to prevent further damage and repair existing ones. An example of the planned slope stabilization for landslide prone area is shown in the following figure. This is the planned stabilization for Km30+300 using Gabions.

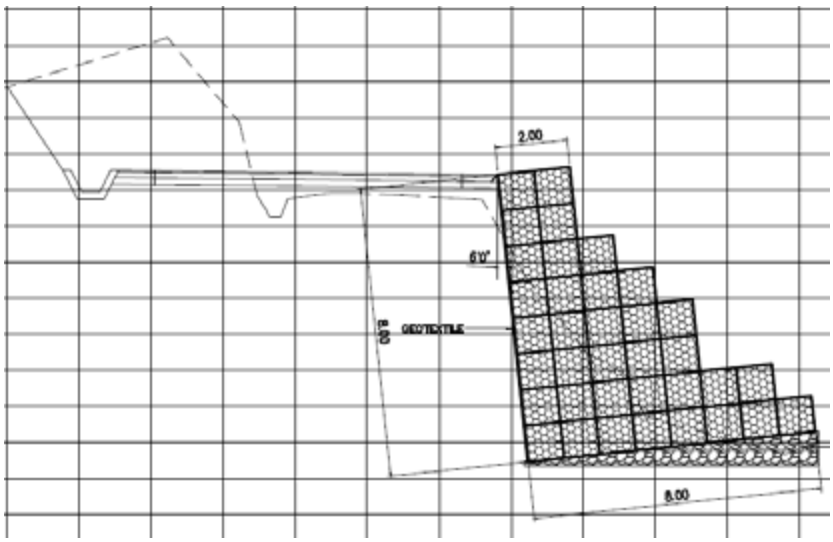

Figure 13 Slope stabilization for landslide prone area (Km30+300)

Impacts on Water Resources

To prevent damage to community water supply facilities Contractor should identify and map out pipelines along the road that will be worked on. If needed the pipelines should be moved prior to construction work.

If construction will require to secure water from community sources, a prior agreement by the community should be secured.

Further, to prevent siltation and contamination of surface water bodies, there should be no slope tipping of spoils, no stockpiling of construction materials, fuel, lubricant in active river floodplains and no disposal of wastes in rivers.

Public and Occupational Health and Safety

General Health and Safety Awareness for construction workers will include:

- Introduction to health and safety issues on construction sites including main areas of risk to workers and others
- Education on basic hygiene practices to minimize spread of typical tropical diseases
- HIV/AIDS and STD awareness, including information on methods of transmission and protection measures
- Prohibition of illegal drugs and alcohol on construction sites
- Access to construction camps will be controlled and access restrictions for non-construction personnel will be applied.
- Housecleaning and waste management requirements
- Use of Personal Protection Equipment (PPE) and processes for obtaining relevant PPE
- Penalties for violation of rules and regulations

Socio-Cultural Impacts

To maximize the community's benefits during the construction stage and in order to secure their support of the project, the following measures are recommended.

- As part of the continuing community consultation and public disclosure, advise the local community of project plans in advance of construction, and involve them in planning, as necessary.
- Avoid or minimize disturbances near living areas when possible.
- Control run-off and manage sediments near garden and plantation areas.

- Give priority for the hiring of people from the host communities and provide training to those without skills on road construction
- Include women and other community groups in project activities, particularly environmental monitoring. Conduct orientation and training on the EMP so the local community can become effective partners in EMP implementation and monitoring
- Damage caused by Contractor on private properties, community facilities shall be immediately repaired and compensated by the Contractor if needed.

Temporary employment

To enhance the temporary employment benefits by the host communities of this sub-project, the sucos traversed by the sub-project shall be given priority for hiring. Screening and hiring of local workers from the host sucos shall be done through the District administrators and suco chiefs. Hiring from other sucos shall be done if skills required are not present in the host community.

HIV/AIDS

- Introduction to health and safety issues on construction sites including main areas of risk to workers and others
- Education on basic hygiene practices to minimize spread of typical tropical diseases
- HIV/AIDS and STD awareness, including information on methods of transmission and protection measures
- Prohibition of drugs
- Prohibition of alcohol on construction sites
- Access to construction camps will be controlled and access restrictions for non-construction personnel will be applied.
- Housecleaning and waste management requirements
- Use of Personal Protection Equipment (PPE) and processes for obtaining relevant PPE
- Sanctions for violation of rules and regulations

Trafficking

- Ensure inclusion of clauses requiring compliance with the labor code and no use of trafficked or child labor;
- Ensuring most marginalized (and at risk from trafficking) are part of Project construction workforce;
- Providing direct employment opportunities during project construction; Implementation of CEC including providing range of vocational skills

Cultural Heritage

While discovery of new culturally significant sites is nil since works will be confined within the existing road, the following guidelines are provided for the guidance of the contractor in the event that unreported cultural heritage site is indeed discovered during the implementation of the sub-project. The recommended steps to minimize adverse impacts and avoid conflicts with local communities are as follows:

1. Upon the discovery of a ceremonial site or burial ground, the Contractor shall notify the PMU or the implementation support consulting engineer and shall take steps to protect the site;

2. The Contractor, together with PMU or implementation support consulting engineer shall then discuss and negotiate a suitable arrangement with the communities. The objective shall be to minimize the impacts and preferably move the ceremonial site/burial ground to a mutually agreed safe location. The relevant Provincial and/or National authorities will be notified prior to starting the works.

3. If no agreement can be reached, the relevant Provincial and/or National authorities with jurisdiction on the matter shall be consulted, and the ADB shall be notified. A joint team of the

Authorities, PMU or implementation support consulting engineer, and the Contractor shall hold dialogue with the communities to resolve the issue. It is only after a satisfactory agreement has been formally reached that the Contractor shall resume activities at the concerned site.

Solid waste Management

Contractor shall implement a solid waste management plan. Wastes shall be disposed of in the Tibar waste disposal facility.

Post Construction Impacts

- Clear roadsides of piles of construction materials, construction wastes, equipment, etc.
- Contain all waste and dispose in approved sites;
- During site cleanup, remediate oil stained soils
- Dispose all non-biodegrable solid waste in an approved disposal area (Tibar disposal facility).
- Remove all disabled machinery from the project area.
- Compost all organic wastes
- Rehabilitate borrow sites, stockpiles area

Contingency Preparedness

A contingency plan should be prepared and implemented by the Contractor as part of the site management. The environment, health and safety officer should be designated and shall be incharge of the implementation of contingency plan. . The contingency plan should cover: Personnel Emergency; Facility / construction site contingency; and Natural disasters. Personnel emergency includes accidents and injuries involving the construction workers. The personnel contingency plan shall include the designation on site of an emergency first responder, provision on each of the construction sites of a first aid station and medical evacuation plan.

Facilities / construction site contingency includes fire, structural failures, explosions, major environmental accidents such as massive spills of hazardous materials, etc. The contingency plan for facilities emergency should include prevention measures, orientation and awareness of workers, emergency response plan, contact details of emergency responders e.g. police, fire station, search and rescue, medical evacuation, program for emergency drills.

Preparedness for natural disasters is another part of the contingency plan. Flooding is one of the major natural disasters that occur in certain sections of A04-01 and a plan should be crafted and implemented to protect lives, properties and equipment during flooding events.

4.5.2 Mitigation of Impacts During Operations and Maintenance

Public Safety

Along sections of roads where there is pedestrian traffic within and between settlements, or between settlements and gardens, footpaths and let down points for public transport vehicles and other roads, road safety features will be included as an essential requirement in the design for road upgrading projects.

Community requirements for road safety measures should be discussed with the affected communities during the initial awareness program, and their inputs should be integrated into the design phase. Issues which need to be incorporated into the detailed design for specific projects in more closely settled areas include:

- Measures to slow traffic; e.g. install speed bump at selected places (e.g. settlements, schools, markets, etc)
- Off-road let down stops for public transport.
- Dust suppression sealing.

- Improvements in road signage and pavement markings.
- Attention to road accident blind spots.

Noise Control

Noise originating from roads cannot be considered a major concern, as traffic volumes are generally low. However, at certain locations it is unavoidable that residents living very near the road will be affected by the traffic noise.

5. PUBLIC CONSULTATIONS AND INFORMATION DISCLOSURE

Public consultation is a continuing process for the duration of the sub-project implementation. This is to ensure transparency and to ensure that public concerns that might arise in the course of the rehabilitation works for A04-01are adequately addressed

The first public consultations done during the early part of the project is the consultation held at the ADB-World Bank Conference Room on April 30, 2009. Over 40 participants from various departments of the Government of Timor-Leste, international and national NGO members, officers from international development agencies and some District Administrators attended the workshop. The participants were actively involved in discussions related to poverty reduction, the Project's goals and environmental issues.

In addition the following government agencies have been consulted:

i. Ministry of Economy and Development, Directorate of Environmental Services (DoE), to obtain information on the Institutional Laws and Guidelines applied in road rehabilitation and improvement projects;
ii. Ministry of Agriculture, Fisheries and Forestry (MAFF), Division of Forestry, Directorate for Protected Areas and National Parks, to obtain information on environmental Protected Areas and other sensitive environmental resources, including ALGIS, the government's GIS data center;
iii. Ministry of Transport, Communication and Public Works, Division of Road, Bridges and Flood Control, to discuss the capabilities of that agency to manage the environmental requirements of the Project.
iv. Ministry of Finances (MoF), Assets and Property Advisor
v. UNDP Poverty Reduction and Environment Unit, Sustainable Land Management (SLM) Project and Climate Change Unit

Continuing consultation with local communities was pursued during the preparation of this IEE. As part of the institutional consultation, the offices of the NGO Haburas Foundation and the Directorate of Environment were visited. The meeting with Haburas Foundation was with the executive director, Mr. Demetrio Caravalho. Mr. Caravalho gave an overview of the biodiversity conservation program of the country and mentioned that areas

Two public consultations were done during the conduct of this IEE, a formal consultation and an informal interview of individuals. The outcome of these consultations is described in the following sections.

5.1 Formal Public Consultation

A formal public consultation was held in Gleno, Ermera on 29 June 2011. The consultation was organized with the assistance of the District Administrator's office of Ermera. The District of Ermera extended assistance by way of providing the venue, sound system and LCD projector. The office also facilitated the distribution of the invitations to the suco chiefs.

The participants to the meeting included suco chiefs of 22 sucos of Ermera, representative from the District police and representatives from Water and Sanitation, the NGO Lao Hamutuk. A total of 34 participants attended the consultation.

The consultation commenced at 10.00 A.M with a welcome address by the District Administrator, Mr. Victor dos Santos. This was immediately followed by the presentation of the project by the National environmental specialist Mr. Juviano Aparicio. The power point presentation is enclosed as Attachment 5. The consultation was used as a venue to introduce the project as well as collect

information and suggestions from participants. The public consultation was facilitated by Mr. Carlos de Deus, the social and resettlement assistant.

Appropriately, the meeting was also used as an opportunity by the local police to encourage the suco chiefs present to file their application for drivers' license. Indeed, one of the ways to ensure road safety.

In his address, the District Administrator encouraged those who attended to participate in the process. At the same he also lamented that Ermera is getting less development projects than the other districts despite the fact that it is the producer of the country's leading export commodity.

The participants expressed optimism about the project and gave their support. Among the benefits anticipated by the participants include employment during construction. They stressed the point that construction workers should all be recruited from the host communities

Among the issues raised during the consultation are:

a. When will the implementation of road rehabilitation project starts?
b. Will the quality of the road better than previous construction?
c. Will the community get some compensation for their land and properties Due to the road widening?

The participants were informed that the project has just started the feasibility study and preliminary design. They will be duly informed during succeeding consultation on the project's implementation schedule.

The issue of the quality of the road after rehabilitation was also the topic of discussions. Apparently, previous repair works did not last long making the local residents wary of the durability of future repairs. They were reassured that the repair and rehabilitation are being planned properly.

The other concern that was voiced out by several participants is compensation for land and properties that will be affected by the widening. It was pointed out that the road repair will be confined within the existing right of way to avoid land acquisition. Again, they were informed that the project is in the feasibility stage and requirements for widening will only be known after the detailed design is completed.

Plate 2 Public consultation photographs
(Top left shows the venue, top right shows the District Administrator of Ermera opening the consultation, bottom photos shows participants interacting during the consultation)

Suggestions from the participants were also solicited and the following are the key suggestions:

a. To minimize conflict during to the Road project Implementation, it is best that the Contractor recruits worker from the local community itself not from other district.
b. For efficiency of project implementation, it is suggested that construction be done during the dry season and avoid the rainy season.
c. The representative from the district water and sanitation cautioned the presence of water supply line along the road, and that construction should avoid damaging these pipelines.
d. We are also suggest the government to choose the best company to handle this road project, because it will be just a waste of money if the road that will be repair can only last for 2-3 years.
e. The participants also stressed that if the government wants all the farmers to benefit from this project, it should also consider repairing some rural road because there a lot of farmers who live far from the main road.

5.2 Informal Survey

Informal public consultation was conducted on 26-28 May 2011. The consultation covered the Sucos of Lihu Railaco, Toko Luli, Ainapa and Talimoro, Riheu, Fatukeru and Lau Ala in the Sub district of Gleno, Ermera district. This consultation has been conducted along the sub-project road among people who live along the roadside. The survey was directed towards securing village level information on waste management, natural hazards, water supply and presence of cultural sites in the area.

It was gathered from the respondents that there is no solid waste management plan in their community. Water source according to respondent is from the community water system, from neighbors' water source or from river during the summer season.

The hazards recognized in their community are flooding, erosion and landslides.

It was also gathered from the respondents that they are not aware of any cultural sites in their community.

5.3 Public Disclosure

As part of the public disclosure process, ADB, during project implementation, will post on its website the Final IEE and the Environmental Monitoring Reports submitted by implementing / Executing Agencies upon receipt. This is to allow the affected people, the other stakeholders, and the general public to provide meaningful inputs into the project design and implementation.

6. GRIEVANCE REDRESS MECHANISM

The Tibar-Gleno Road traverses populated areas. While an EMP has been prepared, it is possible that inadequate implementation of the EMP could occur. Such situations might result to disturbance and nuisance to the people residing along the road or people using the road during the rehabilitation works. To provide the affected people a direct access to the project authorities to lodge their complaints and have their grievances redressed within the appropriate time, the project shall set up a grievance redress mechanism that will be implemented throughout the rehabilitation period.

A complaint registry shall be set up in the field office of the contractor and people shall be informed of its presence. The registry shall accept complaints on environmental safeguards issues during the rehabilitation works. The complaints received shall be listed in the registry with the name of the complainant and the date of receipt. The Environment Specialist of the PISC shall review the nature of the complaint and ascertain that it is environment related. The PISC shall then direct the Contractor for the necessary action. In case no satisfactory action has been taken by the Contractor, the complainant can report to the PMU. For this purpose, the PMU shall assign a complaint desk in its office to receive such complaints. The PMU shall coordinate with the PISC to address the complaint.

The complaints received and the corresponding actions taken will form part of the environmental monitoring report submitted to ADB.

7. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

7.1 Environmental Impact Mitigation and Monitoring

7.1.1 Environmental Mitigation

The environmental management plan presents the mitigation measures, the monitoring plan, and institutional arrangements for implementation of the rehabilitation of the Tibar-Gleno. The particular sections of the EMP shall be appended to the Tender Documents for the Contractor's compliance.

Most of the mitigation measures are fairly standard methods of minimizing disturbance, minimizing threats to the safety to population and enhancing the socio-economic benefits during construction to communities along the sub-project road alignment. Summary of mitigation measures is given in Table 9.

Monitoring of the mitigation measures will entail site inspections, interview of roadside residents as well as checking of reports, plans, records and other aspects. During the construction, the dust and noise must not cause nuisance or disturbance to the communities along the road sections being worked on. Exceedance as observed by the PISC environmental specialist or complained by affected people shall be addressed immediately. The PISC environment specialist shall inform the PISC Construction Supervisor of the exceedance who in turn shall be responsible for instructing the Contractor to take corrective action.

Incidents of exceedance and corresponding corrective measures taken shall be reported by the Contractor and shall be included in the regular reporting to MoI and ADB.

In addition, ADB can conduct environmental safeguard review missions at any time, even during pre-construction and construction. On those missions ADB monitors the progress towards implementing the EMP.

7.1.2 Environmental Monitoring

The environmental monitoring for the pre-construction and construction stages of the project is presented in the following sections with the detailed monitoring plan in Table 10.

Pre – Construction

- Ocular baseline survey
- Review of Contractor's guidelines / IEC for Workers, for protection of sensitive ecological systems, health and safety, waste management
- Review of Construction Plan, particularly for sites of stockpile, staging area, construction camp; environmental provisions for construction camp
- Site inspection of quarry site and asphalt mix plant if Contractor will operate its own; inspection of government permits to operate the facilities (including environmental permit

Construction Stage - Regular Monitoring

Visual monitoring using the monitoring checklist prepared by MoI in the 2009 IEE (**Attachment 3)** shall be implemented as part of regular monitoring. In addition to the road works, quarry sites, asphalt hot mix plant, spoils stockpile area, waste disposal area shall also be subject to visual inspection by the PMU, PISC and DoE. The monitoring shall be conducted as follows:

- Air quality – Dust and Noise

Site inspection shall be done at least once a week by the PISC environment specialist using the checklist (Attachment 4). In addition, residents living along the road should be interviewed for any complaints regarding noise and dust nuisance due to the project.

- Water Quality

Water bodies subject to monitoring are rivers along the route such as the Rihiu River, Angguo / Boera River and Gleno. Although these rivers are observed to be usually turbid, the road rehabilitation should not contribute to its siltation nor contaminate it with fuel and lubricants. Monitoring shall include inspection of water for sign of siltation from construction related sources such as location of stockpiles, equipment yard, fuel depot and other activities near water bodies.

- Social- Cultural Impacts

The socio-cultural impacts monitoring shall cover impacts on community benefits, temporary employment benefits, HIV/AIDS and general health and safety, trafficking, public safety, heritage and cultural impacts.

Details of the monitoring plan are presented in **Table 10.**

Table 9 Environmental Mitigation Plan

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Pre-Construction – Impacts due to location and design			
Encroachment into the forest by workers to collect firewood	Specific prohibitions on collection by construction workers of wildlife and firewood in the forest should be imposed on the construction workers	Implementation by Contractor; Prohibition to be included in IEC for Workers and shall be disseminated during induction of workers	PISC to monitor the content of Contractor's IEC
Adverse impacts on agriculture and loss of some crops	• For seasonal crops, timing of construction or temporary occupation of agricultural land after harvest; • Stockpiles and equipment yard should be located in flat areas away from productive agricultural lands; • Extent of construction area should be clearly marked on the ground to guide equipment operators and workers; • For construction works that will directly affect farmlands, a prior agreement with landowner should be secured by the contractor; • For earth moving works (e.g. slope trimming) in sloping areas, silt fences and brush dams should be installed to prevent damage to crops located downslope; • Damage to crops and loss of crops should be fairly compensated, contractor should immediately restore affected farmlands.	Implementation by Contractor: Compensation of crop loss due to widening by GDRTL	PMU through the PISC
Construction Stage			
Nuisance due to fugitive dust in populated areas	Contractors shall observe and apply the listed dust suppression methods in sections with human	Implementation by the Contractor	Ocular inspection of PISC of work sites and interview

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	populations such as Km14+000 to Km18+000; Km20+000 to Km 20+500; Km21+140 Km22+44 to Km23+095; Km26+154 to Km26+345; Km27+680 to Km28+000; Km31+400 to Km31+750; Km33+500 to Km36+320; Km 42+650; and Km45+425 to end ▪ Spray water on exposed surfaces during dry periods ▪ Wet quarry loads or road fill loads being carried in open trucks ▪ Construction materials and spoils shall be covered when being transported. ▪ Siting of stockpiles area and asphalt mix plant away from residential area. ▪ Borrow sites and bare areas shall be rehabilitated as soon as possible ▪ In case of unpaved roads near settlements, speed limit shall be imposed on haulers and other vehicles of Contractors.		of roadside residents as part of environmental monitoring; Review of Complaints registry
Increased Noise due to operations of construction equipment	Mitigations have to be implemented in the sections of the road mentioned above: Mitigation measures include • Use of newer more quiet equipment • Installation of mufflers in equipment and regular maintenance of equipment; • Time the operation of noisy equipment only during daylight hours; • Enclose noise sources or place noise source (e.g. air compressor) far from the houses; • Protect workers from high noise by rotating the use of equipment among workers and	Implementation by Contractor;	Monitoring by PISC through site inspection of the road sections identified to have human communities; Interview of road side residents; Review of the Complaints Registry

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	use of PPE		
Impacts on Geologic processes – increased rates of erosion & sedimentation	Areas susceptible are the following road sections where slope trimming will be carried out" ▪ Reduce the time surfaces remain bare. ▪ Keep vegetation clearing to a minimum. ▪ Avoid disturbance on steep slopes. ▪ Construct necessary temporary/permanent control structures. ▪ Re-vegetate slopes after construction is completed by applying bioengineering solutions where appropriate. ▪ Rehabilitation of landslide sites and areas with obvious erosion problems as shown above to prevent further damage and repair existing ones; ▪ Complete work during dry season	For implementation by the Contractor	Review of Construction Plan by PISC and ocular inspection of work sites
Impacts on surface water bodies – pollution due to construction associated activities-	There should be no disposal of construction wastes, no stockpiling of construction materials, fuel, lubricants and construction camp should not be locatedin active river floodplains, i.e. Rihiu R, Angguo / Boera R and Gleno River. .	Implementation by Contractor	Review by PISC of construction plan submitted by Contractor by PISC
Impacts due to disposal of solid wastes	Contractor shall implement a solid waste management plan. Wastes shall be disposed of in the Tibar waste disposal facility.	For implementation by Contractor. Contractor to submit waste management plan as part of the Construction Plan	PISC to review waste management plan
Impacts on Socio-cultural and economics	To maximize the community's benefits the following measures are recommended. ▪ As part of the continuing community consultation and public disclosure, advise the local community of project plans in advance of construction, and involve them	For implementation by Contractor	PISC to conduct visual monitoring of work sites and conduct interviews of road side residents; Contractor to include in regular reporting to PISC/PMU the

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	in planning, as necessary. ▪ Avoid or minimize disturbances near living areas when possible. ▪ Control run-off and manage sediments near garden and plantation areas. ▪ Give priority for the hiring of people from the host communities and provide training to those without skills on road construction ▪ Include women and other community groups in project activities, particularly environmental monitoring. Conduct orientation and training on the EMP so the local community can become effective partners in EMP implementation and monitoring Damage caused by Contractor on private properties, community facitlies shall be immediately repaired and compensated by the Contractor if needed.		distribution of workers according to domicile.
Temporary employment opportunities for members of host communities	For this sub-project, the priority communities shall be the sucos traversed by the sub-project. Screening and hiring of local workers from the host sucos shall be done through the District administrators and suco chiefs. Hiring from other sucos shall be done if skills required are not present in the host community.	For Implementation by Contractor;	Monitoring of hired workers,by PISC. Contractor to submit as part of regular reporting, the distribution of workers by place of domicile
HIV/AIDS Risks and Health and Safety in General	▪ Introduction to health and safety issues on construction sites including main areas of risk to workers and others ▪ Education on basic hygiene practices to minimize spread of typical tropical diseases ▪ HIV/AIDS and STD awareness, including information on methods of transmission and	IEC for workers to be prepared and implemented by Contractor.. Written notices shall be posted and verbal reminders during induction of workers.	PISC to review IEC materials for workers submitted by Contractor.

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	protection measures ▪ Prohibition of drugs ▪ Prohibition of alcohol on construction sites ▪ Access to construction camps will be controlled and access restrictions for non-construction personnel will be applied. ▪ Housecleaning and waste management requirements ▪ Use of Personal Protection Equipment (PPE) and processes for obtaining relevant PPE ▪ Sanctions for violation of rules and regulations		
Trafficking	Ensuring inclusion of clauses requiring compliance with the labor code and no use of trafficked or child labor; Ensuring most marginalized (and at risk from trafficking) are part of Project construction workforce; Providing direct employment opportunities during project construction; Implementation of CEC including providing range of vocational skills	For implementation by Contractor.	Contractor to include in regular reporting any skills training and recruitment of workers conducted. Also, report the distribution of workers according to domicile. Report to be reviewed by PISC.
Traffic Safety	The PMU will ensure that all safety related aspects of the operations, as integrated into the project design, will be carried out. Suggested measures to ensure traffic safety are: ▪ Install lights and cautionary signs in hazardous areas. ▪ Establish footpaths and pull-off bays along roads; through villages; and near markets, schools, and other community facilities. ▪ Include safety instructions for the construction activities in the contract documents ▪ Ensure sufficient visibility along the road section according to standard specifications	Implementation by Contractor	PISC to review construction plan and conduct ocular inspections of

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Impacts on Cultural Heritage	Procedures to be followed in case of discovery of artifacts are: (i) Cease operations and inform PISC (ii) Contractor and PMU negotiate with community (iii) If no agreement, PMU consults Provincial or National authorities, notify ADB. Joint team of authorities to negotiate with community; Work resumes only if there is satisfactory agreement	For implementation by Contractor; Contractor shall instruct Foremen / supervisors of this protocol; Contractor to report to PISC discovery / encounter of artifacts / cultural & heritage sites.	PISC to review report
Post construction Impacts Mitigation	▪ Clear roadsides of piles of construction materials, construction wastes, equipment, etc. ▪ Contain all waste and dispose in approved sites; ▪ During site cleanup, remediate oil stained soils ▪ Dispose all non-biodegrable solid waste in an approved disposal area (Tibar disposal facility). ▪ Remove all disabled machinery from the project area. ▪ Compost all organic wastes ▪ Rehabilitate borrow sites, stockpiles area.	To be implemented by Contractor as each road section is completed.	PISC to conduct ocular inspection of site.
Operations Stages			
Public Safety	Road safety features will be included as an essential requirement in the design for road upgrading projects. ▪ Measures to slow traffic; e.g. install speed bump at selected places (e.g. settlements, schools, markets, etc) ▪ Off-road let down stops for public transport.	To be addressed during detailed design	Monitoring by PMU / PISC

Potential Environmental Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	▪ Dust suppression sealing. ▪ Improvements in road signage and pavement markings. ▪ Attention to road accident blind spots		
Rehabilitation and Maintenance - environmentally beneficial and makes road safe for travel,	Timely maintenance work.		

Table 10 Environmental Monitoring Plan

Work Stage	Mitigation Measure	Monitoring Required	Location	Frequency	Date Required	Completion Date	Responsibility
Pre Construction							
1.	Specific prohibitions on the construction workers particularly against encroachment of ecologically sensitive areas and collection of wildlife (plants and animals) and firewood.	Review of the guidelines / IEC issued to workers; Assess awareness of laborers regarding guidelines / rules	Contractor's field office and construction camp	Once prior to construction; Continuous monitoring of compliance	Prior to construction Part of weekly monitoring		PISC EHSO/PISC
2.	Inspection of proposed quarry, borrow, disposal site, asphalt plant site	Ocular inspection; Issuance of government permits	Proposed sites	Once prior to approval of sites by PMU	Prior to start of work		PISC PMU and Contractor
3.	Protection of water bodies from pollution	Ocular inspection of work sites, camp site, quarry site, asphalt mix plant	Site	Once at the start and regular monitoring during operations	After camp, quarry, borrow pits, asphalt plant has been set up		PISC/PMU/ Contractor

Work Stage	Mitigation Measure	Monitoring Required	Location	Frequency	Date Required	Completion Date	Responsibility
4.	Establish baseline environmental condition	Visual inspection using checklist	Part of sample road where settlements are located; Quarry site, borrow pit, asphalt mix plant site,	Once prior to start of works	After selection of sites		PISC/PMU/
Construction Stage							
5.	Dust suppression and management of spoils and bare areas	Visual monitoring of sites and inspection of records of dust suppression activities	Active work sites where there are human communities	At least once a week			PISC/PMU
6.	Management of noise impact	Site inspection and interview of residents for complaints on project related nuisance	Same sites as air quality monitoring sites	At least once a week			PISC/PMU /EHSO
7.	Management of slope stabilization works to minimize erosion	Ocular inspection of work sites and monitoring with the use of a checklist	Slope stabilization work sites	At least weekly	During construction works		EHSO / PISC /PMU
8.	Protection of water bodies from pollution	Ocular inspection of work sites and monitoring with the use of a checklist	All water bodies where work is in progress	At least weekly	During construction works		EHSO / PISC /PMU
9.	Maximize benefits to beneficiary communities	Monitoring of compliance with guidelines, employment of locals, etc.	Work sites / contractor's office	Quarterly	During construction works		PISC / ESHO

Work Stage	Mitigation Measure	Monitoring Required	Location	Frequency	Date Required	Completion Date	Responsibility
10.	General Occupational Health and safety including HIV/AIDS awareness	Monitoring of implementation of awareness program; Laborers' compliance with health and safety guidelines Inspection of upkeep of camp and work area etc.	Contractor's field office, construction camp	At least weekly as part of the ocular inspection	During construction work		PISC / EHSO / PMU
11.	Prevention of trafficking	Review of the Contractor's policy towards hiring of trafficked individuals and other guidelines;	Contractor's field office	Once before start of construction and during construction period	During construction		PISC / EHSO / PMU
12.	Protection of cultural heritage	Assess awareness of workers on the guidelines in case of accidental find	Contractor's field office	At least once i.e. during induction of new laborers	During construction		PISC / EHSO / PMU
13.	Protection of workers from wildlife hazards through awareness	Assess awareness of workers on guidelines regarding avoidance of wildlife hazard	Contractor's field office	Once after induction of new workers	During construction		EHSO / PMU / PISC
Operations Stage							
14.	Traffic Safety – Road safety features to be included in the rehabilitation	Inclusion of the safety features in the detailed design	PISC's office	Once after completion of detailed design	Prior to approval of the design		Detailed design consultant / PMU

7.1.3 Reporting Arrangement

Baseline Monitoring Report

The Baseline Monitoring Report will be submitted to MOI and ADB prior to the commencement of civil work MOI would forward a copy of this report to the National Directorate of Environmental Services.

Environmental Monitoring Reports

The quarterly environmental monitoring reports will include the: (i) environmental mitigation measures; (ii) environmental monitoring activities; (iii) details of monitoring data collection; (iv) analysis of monitoring results; (v) recommended mitigation measures; (vi) environmental, health and safety trainings conducted within that timeframe; and (vii) violations of environmental regulatory mechanism. The environmental monitoring reports will be submitted quarterly to the Ministry of Infrastructure and every six month to ADB throughout the construction stage and annually after completion of construction. MOI would forward a copy of this report to the National Directorate of Environmental Services.

Environmental Monitoring Report on Completion of the Project

Within one calendar year from the date of completion of the construction activity; the PMU will submit a 'Project Completion Environmental Monitoring Report' to the ADB, summarizing overall environmental impacts on the physical, ecological and socio-economic environment due to the new construction. At this stage, compliance with the recommendations of the EMP will be subject to review missions by the ADB, aside from the safeguard review missions that ADB conducts during the pre-construction to the construction period.

7.1.4 Responsibilities and Authorities for Implementation of Mitigation Measures and Monitoring Requirements

The agencies and organizations with authority and responsibilities for the implementation of mitigation measures and monitoring are summarized in the following table:

Table 11 The agencies and their respective responsibilities in the implementation of the EMP

Organization	Responsibilities
Ministry of Infrastructure (PMU)	• Implementing agency • Overall planning, management and monitoring of the environmental management • Ensure that tender documents and civil works contracts include the project EMP (specific conditions) and specify requirement for preparation and implementation of construction EMP • Ensure that environmental protection and mitigation measures proposed in the project MEP are incorporated into the detailed design and that the Project is implemented following GoTLS's environmental regulations and compliant with ADB's environmental and social safeguards policies; • Ensure that all environmental protection and mitigation measures are carried in accordance with policies, regulations on environment and other relevant laws. • Supervise the monitoring activities • Responsible for reporting to the MoED and ADB (semi-annual basis) • Based on the results of the EMP monitoring, identify environmental corrective actions and prepare a corrective action plan, as necessary for submission to ADB
Project Implementation Support Consultant (PISC)	• Assist MoI/PMU in preparing tender documents and ensure that the EMP provisions are included in the tender documents and civil works contracts; • Provide international environment specialists t undertake regular project monitoring and reporting based on EMP provisions • Assist MoI in monitoring the implementation of mitigation measures and the

	environmental performance of contractors based on the EMP • Incorporate in the environmental monitoring reports the results of environmental monitoring and undertake data analysis • Assist MoI/PMU in environmental monitoring and in preparing monitoring reports for submission to ADB on a semi-annual basis • Implement the capacity building/training program on environmental management contained in the IEE/EMP
General Contractor	Main responsibilities include • construction works and implementation of the construction EMP • Designate on site an Environment and Health and Safety Officer who will oversee the implementation of the construction mitigation measures; • Ensure proper implementation of the mitigation measures • Submit monthly reports to MoI regarding the status of the
Stakeholders-communities along the sub-project alignment and others	• Monitor and assess the implementation of the mitigation measures and monitoring as proposed in the EMP • Participate in public consultation so they can give their opinions regarding the implementation of the EMP; Sucos along the road have been invited into public consultations represented by the suco chief, NGOs like the Lao Hamutuk and Haburas have participated in the earlier consultation. These stakeholders are expected to participate in future consultations during project implementation.
Directorate of Environment/ MoED	GoTL's government agency tasked with the implementation and enforcement of environmental regulations and policies. Responsible for screening and issuing environmental permits to projects as well as monitoring compliance with environmental regulations.
ADB	• Reviewing the IEE • Disclosing reports over ADBs website (Responsibility of ADB Project Leader) • Reviewing environmental clearances granted by GoTL • Reviewing quarterly reports & taking necessary actions • Monitoring EMP implementation and due diligence

The Ministry of Infrastructure (MoI) is the official Executing Agency (EA) for this project and will be responsible for the implementation and compliance with the EMP including the monitoring plan. The Directorate of Roads, Bridges, and Flood Control (DRBFC) will provide counterpart staff to participate in the Project Implementation, particularly the development and implementation of road maintenance program. The PMU will provide day-to-day project management of the Project, and on-the-job training to counterpart MoI staff on implementing road projects and road maintenance program.

Project Implementation Support Consultants (PISC) will be engaged to assist the PMU in subproject appraisal, detailed design, national contractor training, construction supervision, and performance monitoring.

The PMU's capability for social and environmental management will be enhanced with the engagement of national social and environmental specialists. These two national specialists will work closely with the international specialists they will closely liaise with the Engineers cum Environmental Officers (EEOs; Regional Engineer and District Supervisors) of MoI and the Environmental Impact Assessment (EIA) Unit and other relevant officers at the Directorate of Environmental Services (DoE). Construction contractors should also be required to retain environmental specialists to oversee compliance with their respective parts of the EMP and to serve as direct liaison to the international environmental specialist. The requirements to obtain the needed personnel and to comply with the EMP will be made part of the bidding documents.

7.1.5 Environmental Monitoring Data Management and Analysis

The environmental monitoring data will be stored and analyzed using a spreadsheet software like the Excel. This spreadsheet database can later be uploaded into a GIS based database to integrate the spatial and tabular databases for analysis and interpretation.

The basic analysis and interpretation of the monitoring data consists of the following steps:

i. Assess the contractor's compliance with the environmental management plan;
ii. Assess the environmental monitoring data by comparing with the environmental baseline and the appropriate standards;
iii. Determine if there is exceedance or complaints. If there is, review if corrective action has been taken. Determine the need for follow-up testing / monitoring.
iv. Present the monitoring data to the stakeholders during public consultations.

7.2 Capacity Building

Government of Timor-Leste is in its incipient stage of establishing its environmental regulations, standards and guidelines and at this stage it has legislated the law enforcing environmental permitting. The law sets the requirements and procedures for screening, scoping, conduct of EIA & IEE, review, issuance and monitoring. Having been legislated only in 2011, the DOE has had limited experience in enforcing it. The sub-projects under the RNSDP-TIM 0180 offer opportunities for the DoE gain experience in implementing Decree-Law No 5 provisions. The same holds true to validate and fine tune their environmental screening and permitting procedures and for project owners and developers to gain experience and better appreciation and understanding of the environmental impact assessment processes.

With respect to the implementing agency, the Ministry of Infrastructures, it is in the process of integrating social and environmental safeguards specialists within the organizational set up of the PMU.Since DoE and the PMU has limited environmental impact management capacity, designated staff members will be trained in environmental management and monitoring of this road project. Initially, an orientation on the EMP shall be conducted. The orientation shall be conducted by the PISC's international environmental specialist and shall cover, among others, the following topics:

a. The basis for environmental management
   - The GoTL environmental regulation
   - ADB Environmental safeguards policies

b. The EMP
   - Mitigation Measure
   - Monitoring Plan

c. Collection of monitoring data
d. Analysis and archiving

On the-job training and 'buddy' missions shall be carried out to train PMU and DoE staff members in environmental management, establish routine environmental monitoring protocols, and undertake periodic environmental monitoring and audit of construction works during implementation.

It is expected that PMU and DoE staff shall gain sufficient experience in monitoring the EMP implementation and assessing compliance.

7.3 Estimated Cost of Environmental Monitoring

The major expense in the implementation of the EMP (including environmental monitoring, public consultation and capability building) is remuneration of the PISC's international and national environmental specialists. The estimated cost for the EMP implementation of the A04-01 of the RNSD Project, Grant No. 0180-TIM is presented in the following table.

Table 12 Estimated cost of implementing the EMP

	Unit	No of Unit	Cost/Unit US$	Total
a. Remuneration				
International Environment Sp	Manmonth	5	12,000.00	60,000.00
National Environment Sp.	Manmonth	10	3,500.00	35,000.00
b. Travel				
Perdiem International	Manmonth	5	3,600.00	18,000.00
Air Fare International	RT	5	2,000.00	10,000.00
Domestic Travel	Days	40	150.00	6,000.00
Total				**129,000.00**

8. CONCLUSIONS AND RECOMMENDATIONS

Assessment of the existing conditions revealed that the road A04-01 traverses a route which is predominated by agricultural uses, particularly coffee. The relatively high number of residences along the route was noted during the site survey, especially near the town centers of Tibar, Railaco and Gleno where larger communities are found. The sloping terrain over most of the route will be a challenge to environmental management, particularly on preventing or minimizing damage to crops located downslope of the road. These impacts however can be effectively mitigated and no residual impacts have been identified. But damage to crops may not be totally avoided because of the need to widen certain sections of A04-01. Hence, compensation of farmers will have to be included as part of mitigation measures.

More importantly, the proposed repair, rehabilitation, placement of asphalt overlay, drainage repair and slope stabilization work shall remain within the existing road alignment precludes social impacts and long term adverse impacts on the natural environment. Also, there is no reason to believe that the sub-project will induce illegal logging and hunting which are subject to existing laws and regulations. Finally, the proposed works will be very temporary and of short duration and the predicted adverse impacts can be effectively mitigated.

The Category B classification of the Tibar-Gleno (A04-01) sub-project based on both ADB and GoTL guidelines is therefore confirmed and no additional or special studies are needed at this stage.

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ATTACHMENT 1: RELEVANT ENVIRONMENTAL REGULATION OF GOTL

Legislation for Environmental and Natural Resource Management and Pertinent Institutional Responsibility			
Environmental Policy/ Act/ Legislation	**Agency with Primary Responsibility**	**Responsible Ministry**	**Status of Legislation**
Planning and Zoning			
Zoning and Landuse planning	Directorate of Land and Property (DTP)	Ministry of Justice	No exclusive law exists at the moment; nevertheless it is governed through the "Parliament Act No. 1 of 2003"
Development control	National Directorate of Local Development and Territorial Management	None Ministry of State Administration and Territorial Planning	No specific legislation; although the development may be subject to new legislation which is in draft stage. Division of Environment also has a stake through 'Guideline #1 on Environmental Requirements for Development Proposals'.
Building Control	Directorate for Roads, Bridges and Flood Control	Ministry of Infrastructure	None; however there is a Draft Regulation on Building Control – waiting for approval.
Environmental Impact Assessment	Secretary of State for Environment	Minister for Economy and Development	*Environmental Management Act* (Indonesian Law) remains in force. Also Directorate of Environment's Guideline #1- Environmental Requirements for Development Proposals and Guideline #6 on Environmental Screening. DoE Proposal to approve the preparation of Regulation on EIA is currently before Council of Ministers.
Pollution Control	Secretary of State for Environment	Minister for Economy and Development	*Environmental Management Act* (Indonesian Law) remains in force; and Directorate of Environment's Guideline #5 on Prescribed Activities for Pollution Control; Guideline #7 on Storage of Fuel and Oil; and Guideline #8 on Ambient Noise from Stationary Sources. The proposal for preparation of Regulations on Pollution Control has been forwarded to the Council of Ministers.
Forestry and land-clearing			
Trees and Forest	National Directorate of Forests	Minister for Agriculture and	National Forestry Programme and Policy Statement (Dec 2000)

		Fisheries	approved by the Minister for Agriculture in 2001; and UNTAET Reg. 2000/17, but `comprehensive legislation is required.
Biodiversity and protected naturals areas			
Endangered species	National Directorate of Forests	Minister for Agriculture and Fisheries	UNTAET Reg. 2000/19, (interim only) permanent legislation required
Protected Wildlife Areas	National Directorate of Forests	Minister for Agriculture and Fisheries	UNTAET Reg. 2000/19, (interim only) permanent legislation required
Coral reefs and mangroves	National Directorate of Forests	Minister for Agriculture and Fisheries	UNTAET Reg. 2000/19, (interim only) permanent legislation required
Wetlands	National Directorate of Forests	Minister for Agriculture and Fisheries	UNTAET Reg. 2000/19, (interim only) permanent legislation required
Waste Management			
Solid waste (collection and transport)	Secretary of State of Electricity, Water and Urbanization and Local Government Bodies	Minister of Infrastructure	Not in existence at the moment; however funding proposal for a solid waste collection system has been drafted by Government of Democratic Republic of Timor Leste and adopt by UNDP which include funding for legislative drafting.
Solid Waste Disposal (site selection)	Directorate of Environment	Minister for Economy and Development	No specific legislation; but the Directorate of environment's Guideline #3 on Small Landfill Site Selection (Environmental); and Directorate of Environment's Guideline #4 on Interim Tibar Landfill Operations do exist
Sanitation	Secretary of State of Electricity, Water and Urbanization	Minister of Infrastructure	No specific legislation; but the Policy Document has been approved by the Cabinet and there is a Draft Regulations on Sanitation Control, which is awaiting approval of Parliament.
Hazardous Waste	Directorate of Environment	Minister for Economy and Development	No specific legislation, but Directorate of Environment has draft proposal for approval pertaining to the Regulation of Pollution Control and Hazardous Waste. This proposal is currently with the Council of Ministers. A funding proposal for a solid waste collection system has been drafted by Directorate of Environment, which has been adopted by UNDP. This draft includes funding for legislative support system for handling and

			management of hazardous waste.
Water			
Water supply	Secretary of State of Electricity, Water and Urbanization	Minister of Infrastructure	Decree Law No. 5/2009 of January 15: Licensing Regulations, Sale and Quality of Drinking Water
Irrigation	Not clearly Defined	Minister of Agriculture and Fisheries	No Specific legislation exists as of now
Pollution Control	Directorate of Environment	Minister of Economy and Development	Directorate of Environment's Guideline #5: Prescribed Activities for Pollution Control; also there is a proposal to approve the Regulation on Pollution Control, which is currently under discussion with Council of Ministers.
Storm-water Drainage and Urban/Municipal Drainage	Directorate for Roads, Bridges and Flood Control	Ministry of Infrastructure	No specific legislation is in existence; however there is a draft regulation on sanitation and drainage prepared by the consultants hired by ADB for the water and sanitation unit in June 2001; which has not yet been passed by the Cabinet. This draft regulation may require further review.
Chemicals	Crop Production Unit	Ministry of Agriculture and Fisheries	No specific legislation has been enacted till date; nevertheless a policy document has been approved by the Cabinet. There is a draft regulation on the 'Importation and Use of Agriculture Chemicals in Timor Leste'; which has yet to be approved by the Cabinet.
Fisheries			
Fish and Aquatic-life	Secretary of State for Fisheries	Ministry of Agriculture and Fisheries	UNTAET Reg. 2000/19 provides interim protection. On 30 May 2001, the minster approved the strategy document "Fish for the Future", containing to a proposal to develop Fisheries Management Projects which includes preparation respective legislation.
Mineral Resources			
Sand and Gravel Extraction for Construction and Commercial Uses	Secretary of State for Natural Resources; and Directorate of Environment	Minister for Economy and Development	No specific legislation has been enacted; however Directorate of Environment's 'Guideline #2 on Mechanised Sand and Gravel Extraction from River and Borrow Pits' is the guiding document. UNTAET order on 'Temporary Suspension of the Mechanised Extraction of Gravel, Sand and

			other Materials from the Comoro River Basin date 2 Sept 2000' is still valid for this river.
Mining	Secretary of State for Natural Resources	Minister for Economy and Development	No specific legislation exists; but the draft is under preparation
Oil and Gas	Secretary of State for Natural Resources	Minister for Economy and Development	No specific legislation exists; but the draft is under preparation
Heritage and Cultural Affairs			
Heritage	Secretary of State for Culture	Ministry of Education	UNTAET Reg. 2000/19, provide interim protection. Permanent legislation required.
Enforcement			
Fines	Sector specific agency recommend imposition of fine through Transitional Administrator	Transitional Administrator of UNTAET determines fine up to a maximum of US 5,000 for individual, or US$ 500,000 for businesses, corporations and institutions	UNTAER Reg. 2000/17 (on logging) UNTAET Reg. 2000/19 on Protected Areas
Confiscation of prohibited animal or article (animal or coral), tools, equipment or vehicle used in offence.	UN Police and authorized personnel from Local Police are entitled to take action	Deputy Transitional Administrator of UNTAET/Government of Democratic Republic of Timor Leste	UNTAER Reg. 2000/17 (on logging) UNTAET Reg. 2000/19 on Protected Areas
Environmental Awareness			
Public Awareness and Consultation	Undecided as of now; requires clarification. Nevertheless it involves overlapping responsibilities among Directorate of Environment; Ministry of Education and Some other ministries	Ministry of Economy and Development; and Minister for Education	No relevant legislation or guidance exists as of now
Integrate Natural Resource Management			
Catchment Area Management	Directorate of Environment	Minister for Economy and Development	No relevant legislation or guidance exists as of now; however the Directorate of Environment facilities 'Natural Resource Management Working Group' on issues pertaining to catchment area management.

ATTACHMENT 2 – RAPID ENVIRONMENTAL ASSESSMENT FORM

Rapid Environmental Assessment (REA) Checklist

Instructions:

- This checklist is to be prepared to support the environmental classification of a project. It is to be attached to the environmental categorization form that is to be prepared and submitted to the Chief Compliance Officer of the Regional and Sustainable Development Department.
- This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.
- This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
- Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: ADB Grant 0180 TIM- Sub-Project Road Link A04-01

Sector Division:

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		☑	
▪ Protected Area		☑	
▪ Wetland		☑	
▪ Mangrove	☑		Starting point of A04-01 in Tibar
▪ Estuarine		☑	
▪ Buffer zone of protected area		☑	
▪ Special area for protecting biodiversity	☑		Important bird area in Railaco
B. Potential Environmental Impacts Will the Project cause…			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		☑	

SCREENING QUESTIONS	Yes	No	REMARKS
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?		☑	
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		☑	
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	☑		This potential impact will be addressed in the EMP.
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	☑		Quarry operations and asphalt mixing plant shall be part of the sub-project. This will be addressed in the EMP.
▪ noise and vibration due to blasting and other civil works?	☑		The road rehabilitation will require use of construction equipment which can generate vibration and noise
▪ dislocation or involuntary resettlement of people		☑	
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		☑	
▪ hazardous driving conditions where construction interferes with pre-existing roads?	☑		The sub-project is rehabilitation and repair of existing roads hence will affect existing traffic.
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	☑		Setting up of temporary construction camps is a necessity since sections of the road are quite distant from settlements.
▪ creation of temporary breeding habitats for mosquito vectors of disease?		☑	
▪ dislocation and compulsory resettlement of people living in right-of-way?		☑	
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?		☑	
▪ increased noise and air pollution resulting from traffic volume?	☑		The rehabilitation and repair works will add up to traffic due to hauling of construction supplies
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	☑		

ATTACHMENT 3: ENVIRONMENTAL MONITORING CHECKLIST

Sub-Project Environmental Compliance Inspection and Monitoring Form

Sub-Projetu Meio Ambiente Konaba Comformidade Inspesaun no Formulariu Monitorizasaun

Sector : Roads/Dalan
Sektor
Setor

Implementing Agency :_____
Instansi Pelaksana
Agensia Implementasaun

Sub-Project :_____
Sub-Proyek
Sub-Projetu

Monitoring Agency :_____
Agensia Monitorizasaun
Instansi Pemantau

Location :_____
Lokasi
Fatin

Enforcing Agency :_____
Agensia ne'ebe iha poder
Inatansi yang Berwenang

Date :_____
Tanggal
Data

Contractor(s) :_____
Kontraktor/Kontrator

Reporting Period :_____
Periodu relatoriu

Implementation Phase: Preconstruction / Construction / Operation
Persiapan / Konstruksi / Operasi/Preparasaun/Construsaun/Operasaun
Periode Pelaporan

1. Contractor(s) / *Kontraktor/Kontrator*

Contractor(s) Environmental Awareness *Kepedulian Kontraktor Terhadap Lingkungan* *Kontrator nia konhesemento kona ba Meio Ambiente?*	**Yes / No** *Ya / Tidak* *Los/La los*	**Actions Required** *Tindakan Yang Diperlukan* *Asaun ne'ebe presiza*	**Contractor Response / Comment** *Tanggapan Kontraktor / Komentar* *Kontrator nia resposta/Komentar*
Contractor(s) aware of mitigation requirements? *Kontraktor peduli terhadap syarat-syarat pencegahan* *Kontrator hatene konaba prevensaun?*			
Contractor(s) have a copy of IEE EMP? *Kontraktor mempunyai salinan (copy) dari IEE EMP* *Kontrator hetan kopia husi IEE EMP?*			

2. Mitigation Compliance Inspection / *Pemeriksaan Ketaatan Pencegahan/Comformidade Inspesaun konaba prevensaun*

Impact / Mitigation Measure *Ukuran Dampak /Pencegahan* *Impakto/sasukat atu prevene*	**Mitigations Implemented (Yes, No)** *Pencegahan Yang Diterapkan* *Prevensaun ne'ebe implementa tiha ona* *(Ya, Tidak)* *(Los/La los)*	**Mitigations Effective? (1 to 5)*** *Tingkat Keberhasilan Pencegahan (1-5)** *Prevensaun efektivo ka lae (1-5)**	**Impact Observed / Location** *Dampak yang terderdeteksi / Lokasi* *Hetan impakto/Fatin*	**Action Required** *Tindakan Yang Diperlukan* *Asaun ne'ebe foti*	**Contractor Response / Comment** *Tanggapan Kontraktor / Komentar* *Kontrator nia resposta/Komentariu*	**Endorsed by:** *Disetujui oleh* *Autoriza husi:*	
						Implementing Agency *Instansi Pelaksana* *Agensia Implementasaun*	**Monitoring Agency** *Intansi Pemantau* *Agensia Monitorizasaun*

Worker Camps sited appropriately? Kelayakan dari Kamp Pekerja di lapangan ? Trabalhador nia hela fatin diak ka lae?									
Adequate sanitation & waste management at Worker Camps? Apakah memadai Sanitasi dan manajemen sampah di Kamp pekerja ? Sanitasaun no manajemento soe foer fatin iha trabalhador nia hela fatin diak ka lae?									
Erosion or instability of cut faces, quarries and borrow pits? Pengikisan atau Ketidak stabilan dr potongan permukaan dan lubang2 galian? Rai monu ka rai leten la seguru, pedreiras?									

Noise controlled adequately? **Pengendalian kebisingan memadai?** **Kontrola barulho ho diak?**								
Traffic safety measures adequate? **Pengendalian keamanan lalulintas memadai ?** **Seguransa trafiku nian sasukat ho diak?**								
Sedimentation and Pollution of Local water bodies? **Pencemaran dari pengairan konstruksi setempat ?** **Sedimentasaun no poluisaun husi mota?**								
Changes to hydrology of local water bodies, flooding? **Perubahan hidrologi dari pengairan konstruksi setempat, banjir?** **Iha mudansa konaba**								

be'e mota nian, be'e boot?

Mitigation Effectiveness Rating Criteria / *Kriteria Tingkat Keberhasilan Pencegahan/Kriterian nivel konaba prevensaun nian*

Very Good (all required mitigations implemented)
Sangat Baik (semua syarat pencegahan di laksanakan) 100%
Diak liu (todo criteria prevensaun nia lao ho diak) 100%

Good (the majority of required mitigations implemented)
Baik (sebagian besar syarat pencegahan di laksanakan) 75 – 99%
Diak (Kriterian prevensaun nian lao ho diak) 75-99%

Fair (some mitigations implemented)
Sedang (beberapa syarat pencegahan di laksanakan) 50 – 74%
Nato'on (Kriterian prevensaun balu deit mak lao ho diak) 50-74%

Poor (few mitigations implemented)
Jelek (sebagian kecil syarat pencegahan di laksanakan) 30 – 49%
A'at (Kriterian prevensaun oituan deit mak lao ho diak) 30-49%

Very Poor (Very few mitigations implemented)
Sangat Jelek (sedikit atau tidak ada syarat pencegahan di laksanakan) <30%
A'at liu (Oituan ou la iha kiteria prevensaun ne'ebe halao) <30%

3. Ambient Monitoring (if relevant) / *Pemantauan Ambient (jika relevan) Monitorizasaun Meio Ambiente (Karik relevante)*

Parameter *Parameter Parametru*	**Date / Location** *Tanggal / Lokasi Data/Fatin*	**Measured by** *Diukur Oleh Medidas husi*	**Monitoring Equipment** *Alat Yang Dipakai Material ne'ebe hodi uza*	**Result** *Hasi Rezultado*	**Standard** *Baku Mutu Estandarte*	**% Exceedance** *% Kelebihan % Exceder*	**Action Required** *Tindakan yang Diperlukan Asaun ne'ebe foti*	**Contractor Responses / Comments** *Tanggapan / Komentar Komentar Kontrator nia resposta/Komentariu*	**Endorsed by:** *Disetujui oleh Autoriza husi:*	
									Implementing Agency *Instansi Pelaksana Agensia Implementasaun*	**Monitorin Agency** *Intansi Pemantau Agensia Monitorizas*
Water *Air Be'e*										
Air *Udara Aereu*										

4. Summary of Actions Required and Follow-up (if relevant) / *Ringkasan Tindakan Yang Diperlukan dan Tindak Lanjut*

Action Required *Tindakan Yang Diperlukan* *Asaun ne'ebe foti*	**Timeframe (e.g. within one week)** *Periode Waktu (misalnya dalam seminggu)* *Tempu (ezemplu iha semana ida nia laran)*	**Responsible Parties** *Pihak Yang Bertanggung Jawab* *Dirasaun ne'ebe responsavel*	**Follow-up (to be completed if actions are taken** *Tindak Lanjut (dilengkapi bila telah ada tindakan)* *Seguimento (Kompletu ho asaun karik iha)*
			Effectiveness in %: *Keberhasilan:Sedang (beberapa syrat pencegahan di laksanakan)* *Efektivu iha %:*
			Further Action Required?: *Perlu Tindakan Lanjutan?:* *Persiza tan seguimento?*
			Prepared by: *Dibuat Oleh:* *Prepara husi:*
			Date: *Tanggal:* *Data:*

Inspection Completed by: _____ **Date:** ___
Pemeriksaan Ole/Revista husih: *Tanggal/Data:*
Signature:
Tanda Tangan
Asnatura

Add Attachments as appropriate (e.g. list of inspection participation, map(s) showing sites, picture)
Tambahan Lampiran Yang Diperlukan (daftar peserta pemeriksaan, peta, gambar)
Aumenta ho lampiran ne'ebe persiza (lista elementus ne'ebe revista, Mapa, Fotografia)

ATTACHMENT 4: ATTENDANCE SHEET- CONSULTATION

Ministry of Infrastructure

PUBLIC CONSULTATION FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Road Network Development Sector Project – ADB Grant No. 0180-TIM

~~27~~ 29 June 2011

ATTENDANCE

	NAME	AFFILIATION / ADDRESS	SIGNATURE
1	Luciano A.	Acadiri, Loli	
2	Carlos	— " —	
3	Manny Botte.	— " —	
4	Ludovina Gama	— " —	
5	CUSTODIO S. MARTINS	HATOLIA	
6	SIMAO F.P. CARIO	AGD - ERMERA	
7	ALBERTO DE OLIVEIRA	Chefe do Suco Fatubessi	
8	Luis dos Santos	Chefe do suco Talimoro	
9.	Felisberto das NEVES	chefe do Suco Poetete	
10	GRACIANO DE JESUS	CHEFE SUCO TAMAÇO	
11	Marcos Soares	" Suco Manusae	
12	Afonso S. Lemos	Chefe Suco Raimerhei	
13	Graciano M. Idemai	A S D Atsabe	
14.	Alfredo Degama Lemos	CDO Railaco	
15.	Pedro Sebastião Esperito	Chefe do Suco Humboe	
16	Julio do Rosario Lemos	Chefe do suco Sicapat	
17	Teófilo M. de Araújo	Chefe do Suco Aileleu	
18	José Boavida Guimarães	Chefe do suco Hatolia	
19	Geraldo da S. Gomes	— " — Baboe Leten	
20	Laurindo Soares	" Eraulo	

SMEC

Ministry of Infrastructure

PUBLIC CONSULTATION FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Road Network Development Sector Project - ADB Grant No. 0180-TIM

~~27~~ 29 June 2011

ATTENDANCE

	NAME	AFFILIATION / ADDRESS	SIGNATURE
21	Jacinto M. Jesus Vor	R. H.	[signature]
22	Carlos Soares	Chefe Aldeia	[signature]
23	Paulo R. da Cruz	R PASDT	[signature]
24	Jeremias Pereira	PAAS Ramelau Lete	[signature]
25	António Martins	chefe do Suco	[signature]
26	Baltazar dos Reis	Chefe de Suco	[signature]
27	Benedito de Araujo Soares	Chefe do Suco Lauala	[signature]
28	Ildefonso dos N. P. Soares	chefe do suco Riheu	[signature]
29	Bernardo S. Balo	chefe S. Liho	[signature]
30	Julio da Costa	chefe do suco Urahou	[signature]
31	Evaristo S. Martins	chefe suco Lisaulau	[signature]
32	Julio C. Aplisinha	Chefe do Suco Tokoluli	[signature]
33	Domingos da Silva	SAS ERMERA	[signature]
34	Fortunato martins	PAAS Laimea Sarin Tonlo.	[signature]
35	Teotonio de Jesus Araujo	Chefe do Suco Catrai	[signature]
36	Domingos de Deus	SAS Atsabe	[signature]
37	Jonathan Goncalves	Luta Hamutuk	[signature]
38	Julio Gomes	Luta Hamutuk	[signature]

ATTACHMENT 5: PUBLIC CONSULTATION PRESENTATION

TIMOR LESTE: Project Implementation and Support Consultants for the Road Network Development Sector Project - ADB Grant No. 0180-TIM

SMEC

Ministry of Infrastructure

What is RNDP?

- Project by the Government of Timor-Leste, through the Ministry of Infrastructures with assistance from the Asian Development Bank
- Involves rehabilitation of 232km of key national and district roads and maintenance of some 302km of roads,

PUBLIC CONSULTATION
27 and 29 June 2011

Road Network Development Sector
Project - ADB Grant No. 0180-TIM

SMEC

Ministry of Infrastructure

Why is the RNDP important to Timor-Leste?

Table 1 - General Surface Condition of the National and District Roads

Road Condition	National		District		Total	
Fair	122	9%	0	0%	122	8%
Poor	351	26%	9	4%	360	22%
VERY POOR	878	65%	249	96%	1,128	70%
Total	1,362		258		1,610	

ACKNOWLEDGEMENT

- Thanks to the Administration of Liquica and Gleno for hosting this consultation
- Thanks to all of you for sharing your valuable time for this important project

SMEC

OBJECTIVES OF THE RNDP?

- Improve nationwide connectivity,
- Provide access to schools, health services, markets
- Reduce transport related costs, facilitate direct and indirect job creation;
- Improve cross-border trade.
- Contribute to economic growth and reduction of poverty

SMEC

INTRODUCTION

- Introduction of all participants
- Introduction of SMEC and KWK, organizer of this consultation in behalf of the Ministry of Infrastructure

SMEC

What is the coverage of the RNDP?

PURPOSE OF THE CONSULTATION

- Introduce the project to the communities;
- Discuss the social and environmental impacts of the project;
- Solicit the communities' comments and suggestions regarding the social and environmental aspects of the project
- Comply with the due process for undertaking environmental and social impact assessments

SMEC

ADB Component of RNDP under Grant No 0180-TIM

	LINK NO	FROM	TO	CATEGORY	LENGTH KM
1	A03-01	Dili	Tibar	National	7.2
2	A03-02	Tibar	Liquica	National	21.3
3	A04-01	Tibar	Gleno	National	33.3
4	A04-02	Gleno	Ermera	National	11.5
5	A19-01	Ponte Maccassar	Sakato	District	10.0
6	A03-03/04	Liquica	Mota Ain	National	65.8
7	A11-01	Ermera	Maliana	National	63.9

SMEC

How will the roads be improved?

- Improvements will include repair and rehabilitation of road pavements
- Repair and improvement of drainage
- Stabilization of the slopes
- Road safety features

- **All works will be confined within the existing road right of way**

Predicted Environmental Impacts

- Temporary employment during construction
- Intermittent increase in noise because of operations of equipment
- Temporary increase in dust due to increase in number of vehicles, transport and handling of construction materials, presence of dry bare areas;
- Threats to public safety due to increase in number of vehicles brought about by the project
- Possible social concerns because of the entry of outsiders (construction workers) into local communities
- Accidental encroachment into lands and properties by construction equipment, workers and spillage.

A. Road Pavement

- **Alternative 1** – repair and restore to maintainable condition, repair of potholes, edge damage, reconstruction of pavement structure, repair or rehabilitation of shoulders,
- **Alternative 2**, Repair and restore as in Alternative 1 then provide a full asphalt concrete overlay

Management of Environmental Impacts

- Implement measures to enhance the beneficial impacts
- Implement measures to prevent or minimize the adverse impacts. e.g. noise dust, traffic hazards, encroachment, etc.
- Conduct environmental monitoring to detect adverse impacts early on
- Involvement of local communities in environmental monitoring

B. Drainage works

a. Repair the existing drainage
b. Provide new works where present drainage is inadequate
c. Existing drains are to be cleaned or reconstructed where necessary;
d. To ensure free discharge from culverts the following shall be done:

- Build cascades
- Clear streams of accumulated debris
- Construct river training wall

May we ask you for your Opinions and Suggestions?

- How can the beneficial impacts be enhanced?
- Will the improved road enhance income of farmers, e.g. coffee farmers, rice farmers?
- How can the project minimize nuisance of noise and dust?
- How can the project protect community from hazards due to the project?
- Are there other concerns?
- Are the communities willing to be involved in the project, e.g. temporary employment, monitoring?

C. Retaining Structures

- Gabion walls
- Masonry walls
- Breast walls
- Bio-engineering
- Catch Drains
- Check Dams
- Earthworks – cut/fill

Possible Arrangements for the Open Forum

- General question and answer session
- For a big group (>20), are participants willing to break up into smaller groups to ensure that everyone has the opportunity to contribute

D. Road Safety

- Provision of pavement markings
- Provision of road signs
- Routine maintenance of drainage systems

Processing of Community Inputs

ATTACHMENT 6: APPLICATION FOR ENVIRONMENTAL PERMIT

DEMOCRATIC REPUBLIC OF TIMOR-LESTE
MINISTRY OF ECONOMY AND DEVELOPMENT
STATE SECRETARIAT FOR ENVIRONMENT
National Directorate for Environment

APPLICATION FOR ENVIRONMENTAL LICENCE

This is an official form under *Decree Law 05/2011 on Environmental Licensing*. This form should be completed in its entirety and submitted to the National Directorate for Environment, along with all required supporting documentation.

Proponent Information

Proponent: Ministry of Infrastructure Business Registration No.: _____

Contact name for Proponent: Fernando Lemos da Rosa

Proponent's address for correspondence: Av. Mártires da Pátria Manlaio

Telephone (fixed): +670-3311038 Telephone (mobile): +670-7233938 Fax: +670-3311038

Give details of any group(s) of companies that the Proponent forms part of: _____

Activity/Project Information

New development? ☐ Modification, amendment or rehabilitation? ☑ Proposed start date: _____

Location Subdistrict: Gleno Suco: _____ Aldeia: _____

Longitude/Latitude: _____

Sensitive location factors (multiple choices permitted)

☑ Sensitive or valuable ecosystems	☐ Unique and valuable landscape	☐ Archaeological and/or historical site	☑ Densely populated areas
☐ Presence of cultural communities	☑ Sensitive geographical areas	☐ Any kind of protected areas	☐ Other

Further description of location: Tibar to Gleno

Type of project (Choose the most suitable development type)*

☐ Mining	☐ Petroleum Industry	☐ Energy	☐ Industry
☑ Transport	☑ Construction	☐ Sanitation	☐ Water
☐ Agriculture/ Livestock/Forestry	☐ Tourism	☐ Defense and Security	
☐ Other			

Size and scale of project/development: _____

Potential adverse impacts by the proposed project (multiple choices permitted)**

☑ Air pollution	☑ Water pollution	☑ Solid waste	☑ Waste water	☑ Noise and vibration
☑ Soil contamination	☐ Land subsidence	☐ Odors	☑ Land degradation	☑ Soil erosion
☑ Sedimentation	☑ Water use change	☑ Health and safety	☑ Climate change	☑ Socio-economic
☐ Other				

Application continues on next page

Environmental Licence Application, continued

Describe briefly the potential adverse impacts. The potential of adverse impacts are air pollution, soil erosion, land degradation forest and vibration, solid waste and water pollution and ect.

Describe briefly the activities that may cause these impacts. the activities which will cause to those impacts are land clearance, transport mobilization, operation of excavation, asphalt mixing and road construction.

Has any community consultation been conducted? If so, please provide details. The public consultation has conducted in the project areas with the local communities, suco chiefs, local NGOs, and w/ affected people

Declaration of Compliance see in attachment 4.

I, the undersigned Proponent (or representative, there of), hereby state that the information provided in/with this application is accurate and complete. I declare that I, and my agents, will comply with all applicable laws, regulations and guidelines relevant to this project.

Signature: _____ Date: 31/01/2012

Print name: Fernando da Rosa

Attach required information, including: 1) maps, plans, and drawings that detail the proposal; 2) detailed description of the activity/project; 3) copies of any existing license, agreement, or memorandum established with the RDTL government; 4) the results of any technical/ feasibility studies completed for the proposal.

*Criteria of development type: please refer to Annex I and Annex II of *Decree Law 05/2011 on Environmental Licensing* for guidance on the classification of projects.

**Type of adverse impacts

[Air pollution]	Air emissions from vehicles, construction equipment, industrial plants and so on
[Water pollution]	Water emissions from chemical/agrochemical, fertilizer, oil, heated water, waste water, so on
[Solid waste]	Hazardous/non-hazardous, combustible/non-combustible waste
[Waste water]	Hazardous/non-hazardous liquid waste, domestic waste water, waste oil from factories, and so on
[Noise and vibration]	Noise and vibration from vehicles, construction activities, machinery noise, and so on
[Soil contamination]	Leachate from solid waste, toxic material, and so on, into soil
[Land subsidence]	Pumping underground water, building a facility on unstable land
[Odors]	Pollution (water and air), solid/liquid waste, sedimentation, and so on, creating negative odors
[Land degradation]	Land clearing, large-scale plantations, erosion and so on
[Soil erosion]	Earth works causing cleared or sloped land, deforestation, and so on
[Sedimentation]	Sedimentation by disposal of untreated waste water
[Water use change]	Various activities using large volumes of water; agriculture, industrial processes, hydro power plant, potable water and so on
[Health and safety]	Activities potentially causing accidents such as vehicles, construction equipments, operation facilities and so on
[Climate change]	Activities using fossil fuels, or causing emissions of greenhouse gases
[Socio-economic]	Activities affecting society and/or economy, including land acquisition causing involuntary resettlement, population movement into the affected area, and so on

FOR OFFICE USE ONLY

Date received: Reference number:

Recorded by: Classification: (Category A☐ B☐ or C☐)

Additional comments, notes or recommendations (attached if necessary):