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Projeto de Desenvolvimento do Sector de Transportes e Proteção Costeira/Transport Sector Development and Coastal Protection Project

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Quadro de Gestão Ambiental e Social/Environmental and Social Management Framework

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LISTA DE ABREVIATURAS

AA	Avaliação Ambiental
AFAP	Agência Fiduciária e de Administração de Projetos
AIA	Avaliação de Impacte Ambiental
EIA	Estudo de Impacte Ambiental
EPI	Equipamento de proteção individual
EIAS	Estudo de Impacte Ambiental e Social
GoSTP	Governo de São Tomé e Príncipe (GoSTP)
IBA	Important Bird Area – Área importante para aves
INAE	Instituto Nacional de Estradas
MaB	Programa o Homem e a Biosfera da UNESCO
NAPA	Programa Nacional de Acção para a Adaptação
OMD	Objectivos de Desenvolvimento do Milénio
PGA	Plano de Gestão Ambiental
PIB	Produto Interno Bruto
PNOST	Parque Natural Obô de São Tomé
PNP	Parque Natural do Príncipe
QGAS/ESMF	Quadro de Gestão Ambiental e Social/Environmental and Social Management Framework
RAP	Resettlement Action Plans
RNB	Rendimento Nacional Bruto
SIDA/VIH	Síndroma da Imunodeficiência Adquirida/Vírus de imunodeficiência
STP	São Tomé e Príncipe
PDSTPC/TPC	Projeto de Desenvolvimento do Sector de Transportes e de Proteção Costeira/Transport Sector Development and Coastal Protection Project
USD	Dólares Norte-Americanos

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EXECUTIVE SUMMARY

Introduction

This document establishes the Environmental and Social Management Framework (ESMF) of the Transport Sector Development and Coastal Protection Project (TPC)

The project is funded by the European Investment Bank, Dutch Bilateral Aid and the World Bank (WB), the Government of STP (GSTP) and aims to finance the rehabilitation of the National N1 Road (EN1) from São Tomé to Guadalupe and parts of the sections of the Road in Lembá/Neves, as well as to carry out the works to strengthen the protection of the coast/Marginal of the city of S Tomé.

The National Road N1 is used by more than 76,000 vehicles per week, most of which are light vehicles (47.7%) and motorbikes (47.4%), followed by buses (3.4%), trucks (1.3 %) and tractors (0.1%). The peak period is between 11:00 am and 4:00 pm (37.8%), followed by the period from 06:00 am to 11:00 am (32.4%) and finally the period from 16:00 to 20:00 hours (29.7%). From 20:00 onwards practically no traffic is noticed, or it is very limited. Projections will still be made to understand the potential variations over time, i.e. to 2040, which may be informed by attracted traffic, population growth and the economy itself. Volumes may become significant.

The implementation agencies of the project are the Fiduciary and Project Administration Agency (AFAP), the National Roads Institute (INAE) and the General Directorate of Environment (DGA). INAE is the owner's engineer for the EN1 while DGA is for the Coastal/Marginal protection component.

Project Components

Component 1: Sao-Tome - Guadalupe -Neves road rehabilitation - Civil Works and project supervision.

Under this component the following main interventions are highlighted:

a) Rehabilitation of the current National EN1 Road from S. Tomé to Neves (27Km). The paved road is 5-7 meters wide on average with a dangerous horizontal and vertical alignment. The road is in poor condition and needs rehabilitation. The average traffic is about 1500 vehicles / day with high presence of motorbikes in urban areas. The road is also used by fuel and beer transportation trucks from Neves to the rest of the country. While the section of S Tomé to Guadalupe (about 15 km) is in a more inland region and comprises about 7 km of urban areas and the remaining rural areas, the section between Guadalupe and Neves (approximately 12 km) is a coastal road with steep slopes to the left and with the sea to the right. The rehabilitation of this section of the road also includes the possible stabilization of the rocky slopes, to eliminate / reduce the risk of overturning of rocks;
b) Construction supervision and quality assurance services. The services to be funded will be for all civil works, including coastal protection.

Three (3) possible scenarios are currently being considered for the rehabilitation of the EN1, namely:

- **Scenario 0 -** Scenario without any intervention (scheduled maintenance);

- **Scenario 1 -** Scenario with rehabilitation of pavements and improvement of the safety conditions to a superficial level (without project change);
- **Scenario 2 -** providing for a general review of the road's layout, both at a planimetry level and at an altimetry level, without however disrespecting the existing route, minimizing the intervention and the occupation of soils is that of the area of implantation of the existing route.

Three possible cross-sectional profile types are also considered for (i) rural areas (Type 1, with two lanes of 3.50 m each); (ii) urban areas without parking (Type 2, with two lanes of 3.50 m each); and (iii) urban areas with parking (Type 3, with two lanes of 3.0 each). Each of these types is accompanied by varied elements of the trenches, berms, sidewalks and drains and with different dimensions.

All these elements are still under study, which will culminate in the selection of the best scenario and / or possible combinations between them.

Institutional strengthening: This component will consolidate the road sector institutional set up and improve asset management practices, including:

- Road maintenance as well small scale coastal and slope protections of priority national road sections using performance-based approach, including technical and management capacity strengthening of GIME and local communities;
- Strengthening the institutional capacity of the road fund an INEA in mobilizing road maintenance financing and improving road asset management system.
- Increasing women's participation in GIMEs (the task force will assess whether 50% of GIMEs workers can be women) and raise gender awareness through training. Focus on specific issues will be determined by the results of the Social Assessment.

Component 3: Rehabilitation of the capital sea front Marginal roads and protection against coastal hazards, including:

- Coastal protection of 13 km of S. Tomé coastline, with the rehabilitation of existing sea walls, construction of breakwaters to reduce the energy of oncoming waves, rocky coverings to protect beaches and boats. Most of the existing coastal protection was built during the colonial period. The sea front is often flooded (at least 10 times a year) by surging waves during periods of high tide. Infrastructures, to be identified as part of the study supported by Dutch Cooperation, would help protect the entire sea front from flood and coastal erosion.
- Rehabilitation of the marginal road (10,1 Km) including the "reconstruction" of the road lining, reinforcement of pedestrian walkways, improved pedestrian safety with protected crossings. Due to poor maintenance and lack of massive rehabilitation in the last decades, the infrastructures of the sea front have been largely damaged, hindering the full use of its tourism potential.
- Construction supervision and quality assurance services.

During the formulation of environmental and social safeguards instruments (i.e., this ESMF and the accompanying RPF) there were still few details about this component.

Component 4: Project management support. This project component will finance the operation and incremental costs of the Project Implementation Unit (PIU) including:

- Implementation support to PIU for contract management for the main civil works and consulting services under the project;
- Preparation of supporting studies for future transport and coastal protection projects.

All aspects of project management, i.e. processual and physical, will have to be conducted in accordance with good practices endorsed by funding entities and those of the GSTP. However, Components 1: **Rehabilitation of the São Tomé-Guadalupe-Neves Road: Civil Works and Project Supervision** and 3: **Rehabilitation of the Marginal Road and Coastal Protection**, **including supervision of civil works** that have the greatest potential to generate significant impacts on the natural and social receiving environment, will be given special attention.

ESMF Objectives

Details on rehabilitation and coastal protection interventions will be determined as soon as feasibility studies and final project design have been completed, and these will in part be based on studies that are still ongoing.

It is the lack of detail about the project at this stage that justifies the formulation of an Environmental and Social Management Framework (ESMF), which will guide how the preparation of the Environmental and Social Impact Assessment (ESIA) and its Environmental and Social Management Plan (ESMP) and possibly the Resettlement Action Plan (RAP) will be made.

The ESMF aims to ensure that the set of actions to be carried out are characterized by:

- Environmental and social screening of proposed interventions including Environmental and Social Assessment (ESA) classification and identification of the type of impact assessment to be undertaken
- Steps to be taken to prepare an ESIA and ESMP, including an application for approval by the national agency in charge of environmental assessment
- Institutional arrangements for the implementation of safeguards requirements and measures in the project
- Capacity building plan targeting key stakeholders in safeguards implementation
- Monitoring and evaluation plan to track the implementation of environmental and social measures
- An annual environmental and social audit
- Compliance mechanisms;
- And Descriptions of roles, including terms of reference of all the entities that will be involved in project implementation and especially of the components with environmental and social implications.

The ESMF is developed in accordance with the principles and guidelines related to the environmental and social management adopted by the GSTP and the WB.

The ESMF and the Resettlement Policy Framework (QPR), which was prepared separately to guide the project as to its potential impacts on people, communities and their assets, and in response to the project triggering the involuntary resettlement policy (OP 4.12), set the course to be followed in dealing with various environmental and social issues. The RPF stresses the importance of avoiding / minimizing involuntary resettlement and ensuring that where necessary, consultation and engagement of the affected persons and their representatives are carried out and that Project Affected Persons (PAPs) are compensated and / or assisted prior to the commencement of any construction activity. They should have opportunities to participate in the planning and

implementation of resettlement programs and be assisted in their efforts to improve their livelihoods and living standards or at least restore them, in real terms, to pre-displacement levels or levels prior to the start of project implementation, depending on what is best.

Formulation, Design of Project Components and Interventions

The project triggers four (04) of the 10 + 2 Operational Policies of the World Bank Safeguards, namely the Environmental Assessment (OP/BP 04.01), Natural Habitats (OP/BP 04.04), Physical Cultural Resources (OP/BP 4.11) and Involuntary Resettlement (OP/BP 4.12).

According to the World Bank guidelines and due to what is initially recognized as low-magnitude, localized, limited and relatively easy-to-manage impacts, the project was classified as Category B. For simple Category B projects, with very limited / low environmental and social impacts, the preparation of an Environmental and Social Management Plan (EMSP) based on an ESIA may be sufficient, but in this case, it has also been decided to prepare an Environmental and Social Impact Assessment. The project is preliminarily assessed as having resettlement implications, hence this ESMF will be accompanied by a Resettlement Policy Framework (RPF).

Under the ESMF there will be a process of social and environmental review of interventions to be defined in project development to ensure that the process (i) determines which rehabilitation activities are likely to have potential negative environmental and / or social impacts; (ii) determines the level of environmental and social action required, including whether an ESIA / ESMF and RAP are necessary or not; (iii) determine appropriate mitigation measures to address adverse impacts; (iv) incorporate mitigation measures for the components and interventions that can be financed by the Project; (v) facilitate the analysis and approval of rehabilitation proposals; and (vii) provide guidance for the monitoring of environmental and social parameters during the implementation and operation of the project activities to be designed and approved.

Environmental and Social Management Plan (ESMP)

An Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Management Plan (ESMP) are currently being prepared to ensure that all project interventions (i) **avoid** activities that could result in negative environmental and social impacts on resources or areas considered sensitive; (ii) **prevent** the occurrence of negative environmental and social impacts; (iii) **avoid** future actions that may adversely affect environmental and social resources; (iv) **limit or reduce** the degree, extent, magnitude or duration of negative impacts by reducing the scales of interventions, relocating, redesigning project elements; (v) **repair or rehabilitate** affected resources, such as natural habitats or water resources, particularly when previous developments (in this case mainly the systematic lack of maintenance in recent years) have resulted in significant resource degradation; (vi) **restore** affected resources to an earlier (and, possibly, more stable and more productive) state that matches the purest initial condition; and (vii) **create, improve, or protect** the same types of resources in other appropriate and acceptable locations, compensating for lost resources. This ESMFwill serve to ensure that these aspects are strictly observed.

In addition, the ESMF includes common environmental and social clauses (ESC), which will be included in all tender documents and in the various contracts (contractual clauses) for the design, construction and proper operation of the interventions to be adopted as

components of the project. The ESMF will be made public both within the country as well as in the World Bank's InfoShop.

Training and Capacity Building

There will be extensive training and capacity building to prepare the relevant institutions at various levels to plan, implement, monitor and evaluate the different aspects involved in good environmental and social management, as recommended in the ESMF.

It will be necessary to devise practical ways of reaching all target groups for the training and training needs assessment, as well as for the provision of such training. The "learning by doing" approach will be given top priority.

Monitoring

Monitoring will also be instrumental in ensuring that the objectives set out in the ESMF and the ESIA/ESMP as well as in the RAP, to be prepared as soon as it is confirmed that resettlement is inevitable, are being satisfactorily achieved and where discrepancies exist to undertake opportune corrective actions. The Project Implementation Unit (PIU) will have the overall responsibility for coordinating and monitoring the implementation of the ESMF.

Budget Estimate for the Implementation of the Project's ESMF

The total cost of the preparation and implementation of the ESMF is being estimated at 1.5% of the total value of the intervention components with ESIA / ESMP and RAP implications, namely: **(i) Rehabilitation of the S. Tomé-Guadalupe-Neves Road: Civil Works and Project Supervision; and (ii) Rehabilitation of the Marginal Road and Coastal Protection, including supervision of civil works,** which total US$ xxxx[1]. This brings the total budget to implement the ESMF to US$ xxx[2].

[1] amount to be determined
[2] amount to be determined

SUMÁRIO EXECUTIVO

Introdução

O presente documento constitui-se Quadro de Gestão Ambiental e Social (QGAS) do Projecto do Desenvolvimento do Setor de Transporte e Proteção Costeira em São Tomé e Príncipe.

O Projeto é financiado pelo Banco Europeu de Investimento, a Ajuda Bilateral Holandesa e o Banco Mundial, o Governo de STP e visa financiar a reabilitação da Estrada Nacional N1 de São Tomé - Guadalupe – e parte da secção de Neves, assim como proceder às obras de proteção da orla costeira da Cidade de S Tomé.

A Estrada Nacional N1 regista um tráfego superior a 76.000 veículos por semana, a maioria das quais viaturas ligeiras (47,7%) e motorizadas (47,4%), seguidas de autocarros (3,4%), camiões (1,3%) e tratores (0,1%). O período de pico verifica-se entre as 11:00 e as 16:00 horas (37,8%), seguido do período da 06:00 às 11:00 horas (32,4%) e por último o período das 16:00 às 20:00 horas (29,7%). Das 20:00 em diante praticamente não se nota qualquer tráfego ou este é muito diminuto. Vão ainda ser feitas projeções para ter um entendimento sobre as potenciais variações ao longo do tempo, i.e. até 2040, que poderão ser informadas pelo tráfego atraído, crescimento populacional e da economia em si. Os volumes podem vir a tornar-se significativos.

As agências de implementação do projeto são a Agência Fiduciária e de Administração de Projetos (AFAP) e o Instituto Nacional de Estradas (INAE)

Componentes do projeto

Componente 1: Reabilitação da Estrada S. Tomé-Guadalupe-Neves: Obras Civis e Supervisão do Projeto.

Ao abrigo desta componente destacam-se as seguintes principais intervenções:

a) Reabilitação da atual Estrada Nacional Nº 1 de S. Tomé para Neves (27Km). A estrada pavimentada tem 5-7 metros de largura com um perigoso alinhamento horizontal e vertical. A estrada está em más condições e precisa de ser reabilitada. O tráfego médio é de cerca de 1500 veículos/dia com alta presença de motorizadas nas áreas urbanas. A estrada também é usada por camiões de transporte de combustível e cerveja de Neves para o resto do país. Enquanto o troço de S Tomé a Guadalupe (cerca de 15 km) insere-se numa região mais do interior e compreende cerca de 7 km de áreas urbanas e as os restantes rurais, o troço entre Guadalupe e Neves (aproximadamente 12 Km) trata-se de estrada costeira com declive/inclinação acentuado a esquerda e com o mar à direita. A calçada deverá ser de pavimento asfáltico. A reabilitação desta secção da estrada também inclui a possível estabilização das encostas rochosas, para eliminar/diminuir o risco de derrocadas de pedras;
b) Serviços de supervisão da construção e de garantia de qualidade. Os serviços a serem financiados serão para todos os trabalhos civis, incluindo a proteção costeira.

Conforme afirmado na introdução estão a ser considerados três (3) possíveis cenários na condução do processo de reabilitação:

- **Cenário 0** – Cenário sem qualquer tipo de intervenção (manutenção corrente prevista);
- **Cenário 1** – Cenário com reabilitação de pavimentos e melhoria das condições de segurança a um nível superficial (sem alteração do projeto);
- **Cenário 2** – Cenário que prevê uma revisão geral do traçado da estrada, tanto a nível de planimetria como a nível altimétrico, sem contudo desrespeitar a rota existente, minimizando a intervenção e a ocupação dos solos é a da área de implantação da rota existente.

Estão também em consideração três possíveis tipos de perfil transversal ao longo de toda a via para (i) áreas rurais (Tipo 1, com duas faixas de 3,50 m cada); (ii) áreas urbanas sem parqueamento (Tipo 2, com duas faixas de 3,50 m cada); e (iii) áreas urbanas com parqueamento (Tipo 3, com duas faixas de 3,0 cada). Cada um destes tipos é acompanhado de elementos variados das valetas, bermas, passeios e sumidouros e com diferentes dimensões.

Todos estes elementos ainda estão em fase de estudo que culminarão com a escolha da melhor opção e/ou de possíveis combinações entre estas opções.

Componente 2: Reforço Institucional

Esta componente do Projeto irá consolidar a estrutura institucional do sector rodoviário e melhorará as práticas de gestão de ativos, incluindo:

a) Manutenção de estradas, bem como melhor abordagem, da proteção das encostas e proteção costeira em pequena escala, dos troços de estradas nacionais prioritários, utilizando uma abordagem baseada no desempenho, incluindo reforço das capacidades técnicas e de gestão dos GIMEs e das comunidades locais;
b) Reforço da capacidade institucional do FRN (Fundo Rodoviário Nacional) e do INAE na mobilização de financiamentos para manutenção de estradas e melhoria do sistema de gestão de ativos de estradas;
c) Aumento da participação das mulheres nos GIMEs (a equipa de trabalho irá avaliar se é possível estabelecer como objetivo que 50% dos trabalhadores dos GIMEs sejam mulheres) e aumentar a sensibilização quanto ao género através de realização de formações aos trabalhadores dos GIMEs (qualquer enfoque em questões especificas será determinado pelos resultados da Avaliação Social).

Componente 3: Reabilitação da Estrada Marginal e Proteção Costeira, incluindo supervisão das obras civis

a) Proteção Costeira de 13 Km da costa de S. Tomé, com a reabilitação dos muros marítimos existentes, construção de quebra-mares para reduzir a energia das ondas recebidas, revestimentos rochosos para proteger praias e embarcações. A maior parte da proteção costeira existente foi construída durante o período colonial. A frente do mar é frequentemente inundada (pelo menos 10 vezes por ano) por excesso de onda durante os períodos de maré alta. As infraestruturas, a serem identificadas como parte do estudo apoiado pela cooperação holandesa, ajudariam a proteger toda a frente do mar da inundação e da erosão costeira.
b) Reabilitação da estrada marginal (10,1 Km) incluindo a “reconstrução” do revestimento rodoviário, reforço das calçadas de pedestres, melhoria de segurança dos pedestres com cruzamentos protegidos. Devido a fraca manutenção e falta de reabilitação massiva nas últimas décadas, as

infraestruturas da frente do mar foram amplamente danificadas, impedindo exploração plena do seu potencial turístico.
c) Serviços de supervisão de construção e de garantia de qualidade.

Aquando da formulação dos instrumentos de salvaguardas ambientais e sociais (i.e., este QGAS e o acompanhante QPR) ainda existiam poucos detalhes acerca desta componente.

Componente 4: Apoio a Gestão do Projeto

Esta componente irá financiar as operações e os custos da Unidade de Implementação do Projeto (UIP), incluindo:

a) Apoio a UIP na gestão de contratos para as principais obras e serviços de consultoria no âmbito do projeto;
b) Preparação de estudos de apoio para futuros projetos de transporte e proteção costeira.

Todos os aspetos de gestão do projeto, i.e. processuais e físicos, terão de ser feitos em conformidade com as boas práticas endossadas pelas entidades financeiras incluindo as do GSTP. Porém, são as Componentes **1: Reabilitação da Estrada S. Tomé-Guadalupe-Neves: Obras Civis e Supervisão do Projeto** e **3: Reabilitação da Estrada Marginal e Proteção Costeira, incluindo supervisão das obras civis** que têm maior potencial de gerar impactos significativos sobre o ambiente natural e social recetor.

Objetivos do QGAS

Os detalhes acerca das intervenções de reabilitação e proteção costeira serão determinados assim que terminarem os estudos de viabilidade e desenho final do projeto e estes serão em parte baseados em estudos que ainda se encontram em curso.

É a falta de detalhes sobre o projeto nesta fase que justifica a formulação de um Quadro de Gestão Ambiental e Social (QGIAS), que irá iluminar como a preparação do Estudo de Impacto Ambiental e Social (EIAS) e respetivo Plano de Gestão Ambiental e Social (PGAS) e possivelmente o Plano ou Planos de Acão de Reassentamento (PAR) serão feitos.

O QGAS visa garantir que o conjunto de ações a ser levadas a cabo se caracterizem por:

- Uma triagem ambiental e social das ações propostas, incluindo a sua classificação do ponto de vista da Avaliação Ambiental e Social (AAS) e identificação do tipo de avaliação de impacto ambiental e social a ser realizado;
- Medidas a tomar para preparar AIAS, incluindo pedidos de aprovação pela agência nacional responsável pela avaliação ambiental;
- Arranjos institucionais para a implementação dos requisitos e medidas de salvaguardas ambientais e sociais do projeto;
- Uma identificação das necessidades e subsequentemente um plano de capacitação e desenvolvimento dirigido às principais partes interessadas na implementação das salvaguardas ambientais e sociais;
- Um plano de monitorização e avaliação para acompanhar a implementação das medidas ambientais e sociais;
- Uma auditoria ambiental e social anual;

- Mecanismos de conformidade e de gestão das reclamações; e
- Descrições dos papéis, incluindo termos de referência dos vários agentes que irão atuar no projeto sobretudo nas áreas com potencial de impacto ambiental e social.

O QGAS é desenvolvido em conformidade com os princípios e diretrizes relacionados com a gestão ambiental e social adotados pelo GDST e pelo BM.

O QGAS e o Quadro de Política de Reassentamento (QPR), que foi preparado separadamente para orientar o projeto quanto aos seus potenciais impactos sobre as pessoas, comunidades e seus ativos e em resposta ao facto de o projeto desencadear a política de reassentamento involuntário (OP 4.12), estabelecem o caminho a ser seguido no tratamento das várias questões ambientais e sociais. O QPR destaca a importância de se evitar/minimizar o reassentamento involuntário e assegurar que, onde tal tenha de acontecer, a consulta e o engajamento necessários das pessoas afetadas e dos seus representantes sejam levados a cabo e que as Pessoas Afetadas pelo Projeto (PAPs) sejam compensadas e/ou assistidas antes do início de qualquer atividade de construção. Elas devem ter a oportunidades de participar na planificação e implementação de programas de reassentamento e ser assistidas nos seus esforços para melhorar os seus meios de subsistência e padrões de vida ou pelo menos restaurá-los, em termos reais, aos níveis anteriores ao deslocamento ou aos níveis predominantes antes do início da implementação do projeto, dependendo do que for melhor.

Formulação e Desenho das Componentes e Intervenções do Projeto

O projeto despoleta quatro (04) das 10 +2 Políticas Operacionais das Salvaguardas do Banco Mundial, ou seja, a Avaliação Ambiental (OP/BP 4.01), Habitats Naturais (OP/BP 4.04), Recursos Culturais Físicos (OP/BP 4.11), e Reassentamento Involuntário (OP/BP 4.12)

De acordo com a diretrizes do Banco Mundial e devido ao que à partida se reconhece serem impactos de baixa magnitude, localizados, limitados e relativamente de fácil e simples gestão o projeto foi classificado como sendo de Categoria B. Para os projetos de Categoria B simples, com impactos sociais e ambientais muito limitados/baixos a preparação de um Plano de Gestão Ambiental e Social (PGAS) baseado num QGAS pode ser suficiente, mas neste caso já se decidiu também preparar uma Avaliação de Impacto Ambiental e Social. O projeto é preliminarmente avaliado como tendo implicações de reassentamento, daí este QGAS ser acompanhado de Quadro de Política de Reassentamento (QPR).

Ao abrigo do QGAS haverá um processo de revisão social e ambiental das intervenções a ser definidas no desenvolvimento do projeto para garantir (i) determinar que atividades de reabilitação são suscetíveis de ter potenciais impactos ambientais e/ou sociais negativos; (ii) determinar o nível de ação ambiental e social necessário, incluindo se uma AIAS/PGAS e PAR serão necessários ou não; (iii) determinar medidas de mitigação apropriadas para lidar com os impactos adversos; (iv) incorporar medidas de mitigação para as componentes e intervenções financiáveis pelo Projeto (v) facilitar a análise e aprovação das propostas de reabilitação; e (vii) fornecer orientações para a monitorização de parâmetros ambientais e sociais durante a implementação e funcionamento das atividades do projeto a ser concebidas e aprovadas.

Plano de Gestão Ambiental e Social (PGAS)

Já está em preparação uma Avaliação de Impacto Ambiental e Social (AIAS) e um Plano de Gestão Ambiental e Social (PGAS) com vista a garantir que todas as intervenções do projeto (i) **evitem** atividades que possam resultar em impactos ambientais e sociais negativos sobre recursos ou áreas consideradas sensíveis; (ii) **previnam** a ocorrência de impactos ambientais e sociais negativos; (iii) **evitem** ações futuras que possam afetar negativamente os recursos ambientais e sociais; (iv) **limitem ou reduzam** o grau, extensão, magnitude ou a duração dos impactos negativos por intermédio de redução das escalas das intervenções, mudança de localização, reformulação dos elementos do projeto; (v) **reparem ou reabilitem** recursos afetados, tais como habitats naturais ou recursos hídricos, particularmente quando desenvolvimentos anteriores (neste caso principalmente a sistemática falta de manutenção nos últimos anos) tiver resultado na degradação significativa dos recursos; (vi) **restaurem** recursos afetados a um estado anterior (e, possivelmente, mais estável e mais produtivo), que se equipare à condição inicial mais pura; e (vii) **criem, melhorem ou se protejam** os mesmos tipos de recursos em outros locais adequados e aceitáveis, compensando os recursos perdidos. Este QGAS servirá para garantir que estes aspetos sejam estritamente observados.

Para além disso, o QGAS inclui cláusulas ambientais e sociais comuns (CAS), que serão incluídas em todos os documentos de concurso e nos vários contratos (cláusulas contratuais) para a conceção, construção e operação adequada das intervenções a serem adotadas como componentes do projeto nos próximos tempos. O QGAS será divulgado publicamente, tanto dentro do país assim como no InfoShop do Banco Mundial.

Formação e Capacitação

Vai haver extensiva formação e capacitação com o objetivo de preparar as instituições relevantes aos vários níveis para planificar, implementar, monitorizar e avaliar os diferentes aspetos envolvidos numa boa gestão ambiental e social, como preconizado no QGAS.

Será necessário conceber maneiras práticas de se chegar a todos os grupos-alvo para a formação e avaliações de necessidades de capacitação, bem como para a prestação dessa formação. Será dada prioridade máxima à abordagem que consiste em “aprender a fazer fazendo”.

Monitorização

A monitorização também será fundamental para garantir que os objetivos estabelecidos no QGAS e na AIAS/PGAS assim como no PAR, a ser preparado logo que se confirmar que o reassentamento é inevitável, estejam a ser alcançados de forma satisfatória e onde existirem discrepâncias para que sejam introduzidas ações corretivas oportunas. A Equipa de Gestão do Projeto terá a responsabilidade geral pela coordenação e acompanhamento da execução do QGAS.

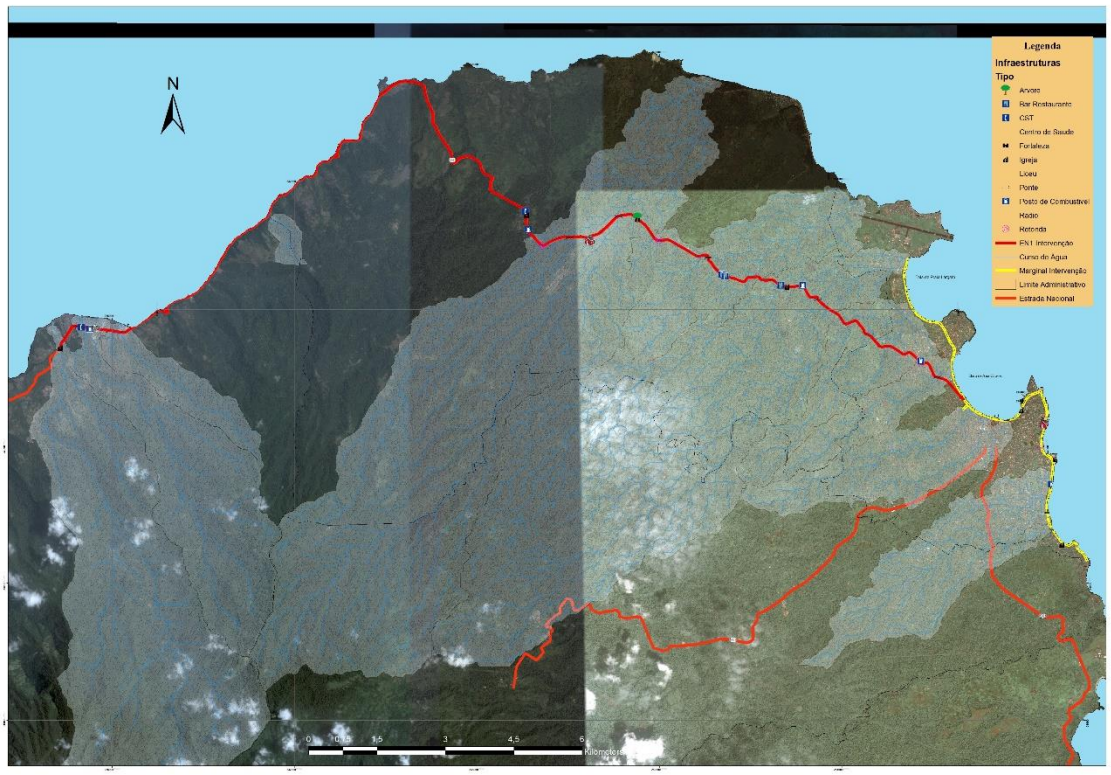
Estimativa de Orçamento para a Implementação do QGAS para o Projeto

O custo total da preparação e implementação do QGAS está a ser estimado em 1,5% do valor total das componentes de intervenção com implicações de AIAS/PGAS e PAR, designadamente: (i) **Reabilitação da Estrada S. Tomé-Guadalupe-Neves: Obras Civis e Supervisão do Projeto**; e (ii) **Reabilitação da Estrada Marginal e Proteção Costeira, incluindo supervisão das obras civis**, que totalizam **xxxx US$** o que traz o total para financiar o QGAS para o valor de **xxx US$.**

1. INTRODUCTION

This document constitutes the Environmental and Social Management Framework (ESMF) of the N1 National Road rehabilitation project, in the sections linking the city of S Tomé to Guadalupe and from there to Neves, as well as to reinforce the protection of the seafront of the city of Sao Tome and adjacent roads (Figure 1). The project is funded by the European Investment Bank, the Government of the Kingdom of the Netherlands, the World Bank (WB) and the Government of São Tomé and Príncipe (GSTP).

Figure 1-1: Overview of the project area and its physical components



By linking the three areas of S. Tome (70,000 inhabitants), Guadeloupe (20,000 inhabitants) and Neves (15,000 inhabitants) the National Road N1 and above all the section referred to is the most active in the whole country. It serves about 60% of the country's population and extends over 27 km. Built during the Portuguese colonial domination the paved road is 5-7 meters wide with a dangerous horizontal and vertical alignment. In recent years it has been in poor condition and in need of rehabilitation and eventually a series of adjustments in its geometric design and features.

According to the most recent traffic count, the road is used by more than 76,000 vehicles per week, the majority of which are light motor vehicles (47.7%) and motorbikes (47.4%), followed by buses (3 , 4%), trucks (1.3%) and tractors (0.1%). The peak period is between 11:00 am and 4:00 p.m. (37.8%), followed by the period from 06:00 am to 11:00 am (32.4%) and finally the period of 16:00 to 20:00 hours (29.7%). From 20:00 onwards practically no traffic is noticed, or it is so small that it was not counted (Prospective, 2018). To the initial count, projections will still be made to understand the potential variations over time, i.e. up to 2040, which may be informed by increased traffic due to population growth and the economy itself. Volumes may become more significant.

Within the scope of the same project, the GSTP will also rehabilitate the coastal shoreline that stretches from Pantufo to the S. Tomé Airport, located within the city of S. Tomé, in a stretch of about 13 km where the road partly extends for 10,1 km. The coastal shoreline and the roads that characterize it have been subject to increasing degradation due to natural phenomena, especially those related to climate change (rainfall intensity, rising water levels, etc.) and due to lack of appropriate maintenance actions.

The natural and social environment in EN1 can be subdivided into two major regions, namely; (i) the interior region, stretching from São Tomé to Guadalupe (15 km) and (ii) the coastal region of Guadalupe to Neves (12 km).

Although from a certain perspective the whole area of study is in the coastal region[3], each of the two regions described above have its own elements that must be considered in defining the geometric characteristics of the alignment, profiles and cross-sections, traffic volumes and composition, resilience to climate change and risks of environmental disasters, rehabilitation costs and economic and financial assessment.

Efforts are being made to ensure that roads guarantee, among other developments (i) comfort and time savings for users; (ii) savings in vehicle operating costs; and (iii) reduction in road accidents. Various teams and studies (e.g. engineering, economics, finance, environment, sociology, traffic, etc.) are being made to ensure that rehabilitation actions translate into environmental and economic gains for the Sao Tomean society.

Particularly In relation to the EN1, at the time of the preparation of this ESMF, the project's engineering team had three (3) possible scenarios for its design and development, namely:

- **Scenario 0** – in this scenario there is the absence of any intervention in the EN1, maintaining the conditions of the road in the same way in which it currently is;
- **Scenario 1** – rehabilitation of the road, without any alteration to its layout, either in terms of planimetric or altimetric alignment;
- **Scenario 2** – providing for a general review of the road's layout, both at a planimetry level and at an altimetry level, without however disrespecting the existing route, minimizing the intervention and the occupation of soils is that of the area of implantation of the existing route.

Although it is understood that road rehabilitation and reinforcement of coastal protection will bring many benefits, it is not to be overlooked that if certain precautions and measures are not taken these actions may result in negative impacts on people and communities at large, as well as in various aspects of their lives, biota and physical environment (water, soil/soil, air, etc.).

The details of rehabilitation and protection interventions will be determined as soon as feasibility studies and final project design are completed, and these will in part be based on studies that are still ongoing. It is the lack of detail on these aspects at this stage that justifies the formulation of an Environmental and Social Management Framework (ESMF), which, among other aspects, will guide how the preparation of the Environmental and Social Impact Study (EIAS) and its Environmental and Social Management Plan (ESMP) and possibly the Resettlement Action Plan (RAP) will be

[3] Different systems use different criteria to define coastal zone, for example. for the Millennium Ecosystem Assessment or McGranaham, Balk and Anderson the coastal area, i.e.
the proximity to the sea, covers all areas up to 100 km from the sea or less than 50-10 m elevation.

conducted. The ESMF is also justified by the fact that the possibility exists that the various components of the project can be finalized and implemented in different time frames and even by different teams.

The Environmental and Social Management Framework (ESMF) aims to ensure that the set of actions to be carried out are characterized by:

- Environmental and social screening of proposed interventions including Environmental and Social Assessment (ESA) classification and identification of the type of impact assessment to be undertaken
- Steps to be taken to prepare an ESIA and ESMP, including an application for approval by the national agency in charge of environmental assessment
- Institutional arrangements for the implementation of safeguards requirements and measures in the project
- Capacity building plan targeting key stakeholders in safeguards implementation
- Monitoring and evaluation plan to track the implementation of environmental and social measures
- An annual environmental and social audit
- Compliance mechanisms;
- And Descriptions of roles, including terms of reference.

The ESMF is developed in strict compliance with the principles and guidelines related to environmental and social management adopted by the GSTP and the WB. Ultimately, the planning, implementation, and operation phases of the project must avoid causing damage to both the natural and social environment.

The basic principles and requirements of the ESMF will be applied throughout the project life cycle by all relevant actors, project managers, funders, designers, contractors, etc. during planning, design, construction and operation and possible decommissioning.

The ESMF and the Resettlement Policy Framework (RPF), which was prepared separately to guide the project as to its potential impacts on people, communities and their assets, and in response to the fact that the project triggers the Involuntary Resettlement Policy (OP 4.12), set out the way to be followed in dealing with the various environmental and social issues. The RPF stresses the importance of avoiding/minimizing involuntary resettlement and ensure that where such will be unavoidable the necessary consultation and engagement of affected people and their representatives will be conducted and that Project Affected People (PAP) will be compensated and/or assisted prior to the start of any construction activities. They will be given opportunities to participate in planning and implementing resettlement programs. PAPs will be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

The ESMF formulation used a series of methodologies with emphasis on (i) reviewing secondary data; (ii) individual and group interviews and discussions with relevant stakeholders; (iii) preliminary socioeconomic assessment of the potential impacts of the project on the receiving social environment; (iv) direct observations and field measurements.

In addition to this introduction, the document comprises twelve chapters, which together will guide the fulfilment of the objectives outlined above, namely:

i. project description;
ii. development context
iii. the receiving natural and social environment
iv. legal and institutional framework with emphasis on WB and GSTP policies and safeguards
v. environmental concerns in the areas targeted by the project.
vi. potential environmental and social impacts and mitigation measures
vii. guidelines for project preparation, implementation, approval and follow-up
viii. guidelines for environmental and social management plans and control requeirements
ix. training and capacity building
x. ESMF monitoring and evaluation
xi. budget estimate

These chapters are complemented by a series of annexes from which the details of the Public Meeting of 22 June 2018 are highlighted and the Terms of Reference for conducting the Environmental and Social Impact Study (ESIA), formulation of the Environmental Management Plan and Social Action Plan (ESMP) and Project Resettlement Action Plan (RAP).

2. PROJECT DESCRIPTION

2.1. Project Components

The Transport Sector Development and Coastal Protection Project consists of four components:

Component 1: Sao-Tome - Guadalupe -Neves road rehabilitation - Civil Works and project supervision.

Rehabilitation of existing National Road N1 from Sao Tome to Neves (27 km). The paved road is 5-7 meters wide with a dangerous horizontal and vertical alignment. It is mostly in bad conditions and in need for rehabilitation. The average traffic is around 1500 vehicles/day with a high presence of motorcycles in urban/town areas. The road is also used by trucks to transport fuel and beer from Neves to the rest of the country. The road section between Guadalupe and Neves (around 12 km) is a coastal road bordering a non-stabilized high slope on the left and the sea on the right. The carriageway will be of asphalt pavement.

As stated in the introduction, three (3) possible scenarios are being considered:

- **Scenario 0** – in this scenario there is the absence of any intervention in the EN1, maintaining the conditions of the road in the same way in which it currently is;
- **Scenario 1** - rehabilitation of the road, without any alteration to its layout, either in terms of planimetric or altimetric alignment;
- **Scenario 2** - providing for a general review of the road's layout, both at a planimetry level and at an altimetry level, without however disrespecting the existing route, minimizing the intervention and the occupation of soils is that of the area of implantation of the existing route.

Three possible cross-sectional profile types are also being considered for (i) rural areas (Type 1, with two lanes of 3.50 m each); (ii) urban areas without parking (Type 2, with two lanes of 3.50 m each); and (iii) urban areas with parking (Type 3, with two lanes of 3.0 each). Each of these types is accompanied by varied elements of the trenches, berms, sidewalks and drains and with different dimensions. The Figures below present an overall impression of the three described types.

Figure 2-1: Type 1 cross section (rural)

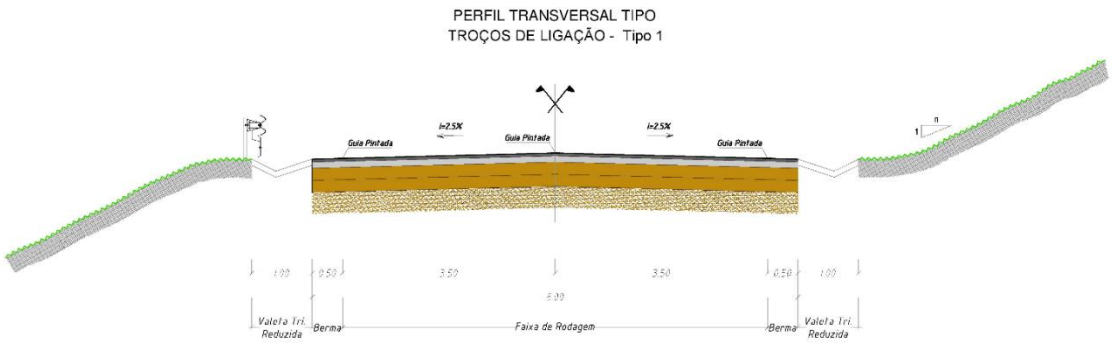


Figure 2-2: Type 2 cross section (urban without parking)

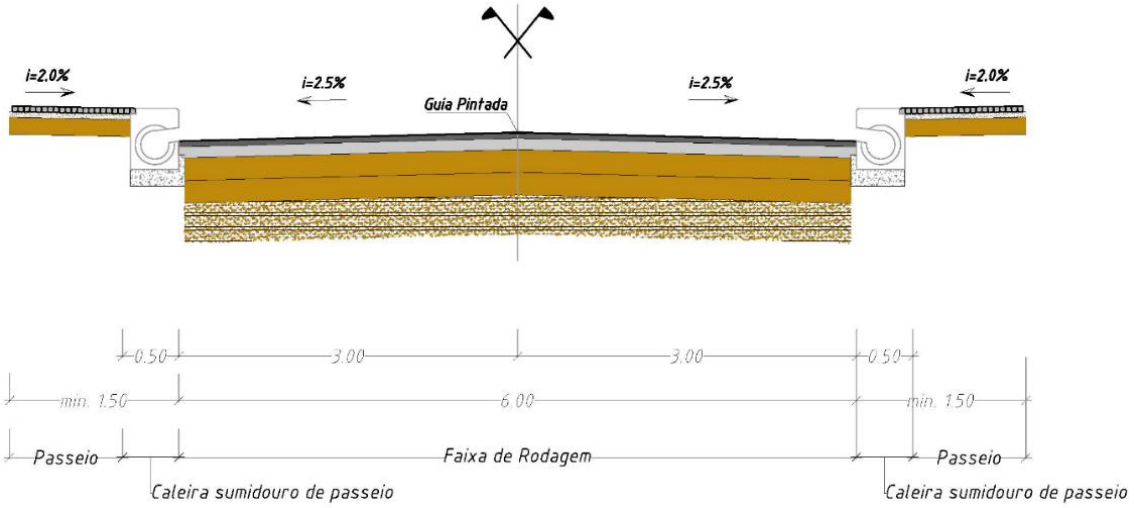
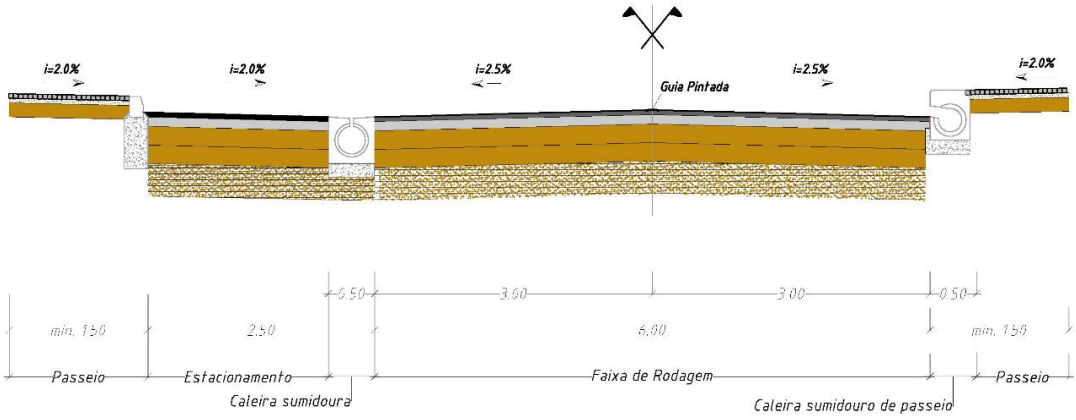


Figure 2-3: Type 3 cross section (urban with parking)



Several studies and evaluations, including the formulation of this ESMF and its accompanying RPF, will lead to the choice of the best option and/or possible combinations between these options.

At the time of formulating the environmental and social safeguards instruments, the pre-feasibility studies for EN1 had already been completed, including preliminary environmental and social assessment. Road design and environmental and social impact assessment were being conducted.

Component 2*:* Institutional strengthening: This component will consolidate the road sector institutional set up and improve asset management practices, including:

- Road maintenance as well small scale coastal and slope protections of priority national road sections using performance-based approach, including technical and management capacity strengthening of GIME and local communities;
- Strengthening the institutional capacity of the road fund an INEA in mobilizing road maintenance financing and improving road asset management system.
- Increasing women's participation in GIMEs (the task force will assess whether 50% of GIMEs workers can be women) and raise gender awareness through training. Focus on specific issues will be determined by the results of the Social Assessment.

Component 3: Rehabilitation of the capital sea front Marginal roads and protection against coastal hazards, including:

- Coastal protection of 13 km of S. Tomé coastline, with the rehabilitation of existing sea walls, construction of breakwaters to reduce the energy of oncoming waves, rocky coverings to protect beaches and boats. Most of the existing coastal protection was built during the colonial period. The sea front is often flooded (at least 10 times a year) by surging waves during periods of high tide. Infrastructures, to be identified as part of the study supported by Dutch Cooperation, would help protect the entire sea front from flood and coastal erosion.
- Rehabilitation of the marginal road (10,1 Km) including the "reconstruction" of the road lining, reinforcement of pedestrian walkways, improved pedestrian safety with protected crossings. Due to poor maintenance and lack of massive rehabilitation in the last decades, the infrastructures of the sea front have been largely damaged, hindering the full use of its tourism potential.
- Construction supervision and quality assurance services.

During the formulation of environmental and social safeguards instruments (i.e., this ESMF and the accompanying RPF) there were still few details about this component.

Component 4: Project management support. This project component will finance the operation and incremental costs of the Project Implementation Unit (PIU) including:

- Implementation support to PIU for contract management for the main civil works and consulting services under the project;
- Preparation of supporting studies for future transport and coastal protection projects.

All aspects of project management, i.e. processual and physical, will have to be conducted in accordance with good practices endorsed by funding entities and those of the GSTP. However, Components 1: **Rehabilitation of the São Tomé-Guadalupe-Neves Road: Civil Works and Project Supervision** and 3: **Rehabilitation of the Marginal Road and Coastal Protection**, **including supervision of civil works** that have the greatest potential to generate significant impacts on the natural and social receiving environment, will be given special attention.

2.2. Project Implementation Arrangements

The project financiers are the European Investment Bank, Government of the Kingdom of the Netherlands (Netherlands); World Bank and the Government of São Tomé and Príncipe (GSTP) itself. Funds will be administered on behalf of the GSTP by the Ministry of Finances and Public Administration (MIFAP) through AFAP in coordination with the INAE and the Road Fund and the General Directorate of Environment (DGA). The owner's engineers are INAE for the EN1 and DGA for the Coastal Protection component. In coordination with local authorities, INAE and DGA will ensure that the development of the project is in line with national, district, municipal and local development strategies and plans and that the standards in force in the various spheres are adhered to.

In addition to the participation of the external financing entities, the project management will be guaranteed by a Management Committee that will include AFAP, INAE, Road Fund, DGA and the representatives of the governments of the districts of Água Grande,

Lobata and Lembá as well as the representatives of the local municipalities and localities of the cities of S. Tomé, Guadalupe and Neves.

The implementation of the project will be under the responsibility of AFAP/INAE, Road Fund and DGA, which will form the Project Implementation Unit (UIP/PIU), which will coordinate the participation of all other entities including contractors to provide goods and services during the pre-feasibility, feasibility and final design, including preparation of environmental and social safeguards and subsequent environmental and social impact studies and resettlement action plans and implementation (construction, works supervision, including compliance with environmental and social management requirements). The operation and maintenance will be carried out by INAE/Road Fund, DGA, District Governments and the Municipalities/Localities that host the two main physical components of the project. AFAP will participate in monitoring, evaluation and audit actions on a regular basis.

Particularly during construction and subsequent maintenance and operation, AFAP and INAE/Roads Fund and DGA, in close collaboration with suppliers of goods and services, will ensure the involvement of GIMEs and the fulfilment of the requirements related with the establishment of opportunities for broad participation of women to prioritize labor-intensive approaches, reduce costs, share benefits and contribute to poverty alleviation.

AFAP, through its Environmental and Social Safeguards Specialist (ESSS) and in coordination with the INAE/Roads Fund and DGA, will ensure that, especially during the preparation and implementation of the project, there is strict compliance with the environmental and social management requirements of this ESMF and subsequent ESIA/ESMP and RAP. This will be done directly and through selected and trained personnel from INAE /DGA and service providers in general.

Diagram 2-1: Overview of the project's institutional arrangements

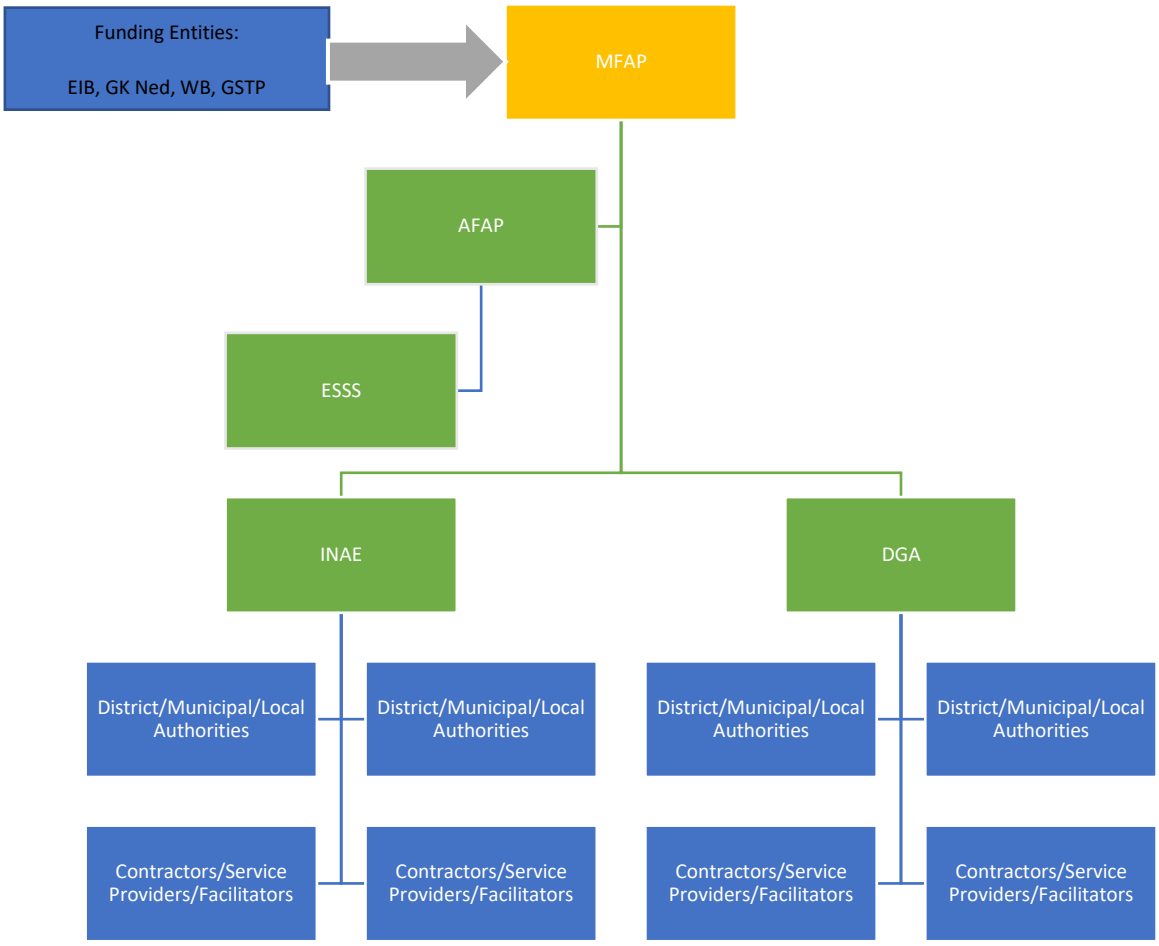


Diagram 2-1 is a graphical representation of the links between the main institutions in the execution of the project. It does not depict the collective management bodies, which in addition to the entities presented will include other stakeholders such as the transport, tourism, quality control and standards sectors (e.g. Engineering Laboratory, National Institute of Meteorology etc.).

3. DEVELOPMENT CONTEXT

3.1. Overview

Despite being one of the smallest economies in Africa Sao Tome and Principe is witnessing average annual GDP growth rates that are close to 5%[4] in real terms and is in one of the fastest growing economies situated a little above average in Africa and the world, with low inflation (around 4%5), which is due to good macroeconomic management policy, recovery of traditional sectors of its economy such as the production and export of cocoa, coffee, vanilla and pepper as well as exploring new areas such as tourism.

There was a certain period in which the country was placing high expectations on the oil industry as a driver of the economy, after discovering extensive reserves of this resource, but it did not take long for this to be associated uncertainties and it has been largely put aside. This has brought the traditional sectors of the economy back to central position

Tourism expansion and development to access foreign currency has been at the center of attention and fisheries continues to be one of the main economic activities of the country, which is also strengthened by the recovery of agriculture including the production of cocoa. The other agricultural products are coconut/copra, palm, coffee, various fruits (banana, papaya, etc.) and beans and livestock production is dominated by poultry and other small animals (sheep, goats, pigs) as well as cattle that appears to be less expressive.

The country consists of two main islands (Sao Tome and Principe Islands) and several other islets, and the set of islands total a surface area of 1,001 square kilometers, inhabited by about 190,000 inhabitants. The country's coastline totals 209 km and is the second smallest country in Africa. In terms of population density, the country occupies the 65th position in the world, with about 156.84 inhabitants /Km².

The country is subdivided into two territories, São Tomé and Principe, which in turn comprise seven administrative districts. Six of the districts are located on the main island of São Tomé while the other district (Pagué) covers the smaller island of Príncipe, also called autonomous region of the same name. The map below is the graphical representation of the administrative division of the country where the district capitals are indicated in parentheses. The project area is in the districts of Água Grande[6] (S. Tomé), Lobata (Guadalupe) and Lembá (Neves).

4 The International Monetary Fund estimates that the economic growth of São Tomé and Principe was on average of 5 % over the last 3-4 years (IMF, Antoinette Sayeh, Director of the African Department, February 2016)

5 Idem (FMI, 2016).

6 That comprises around 39% of the country's total population.

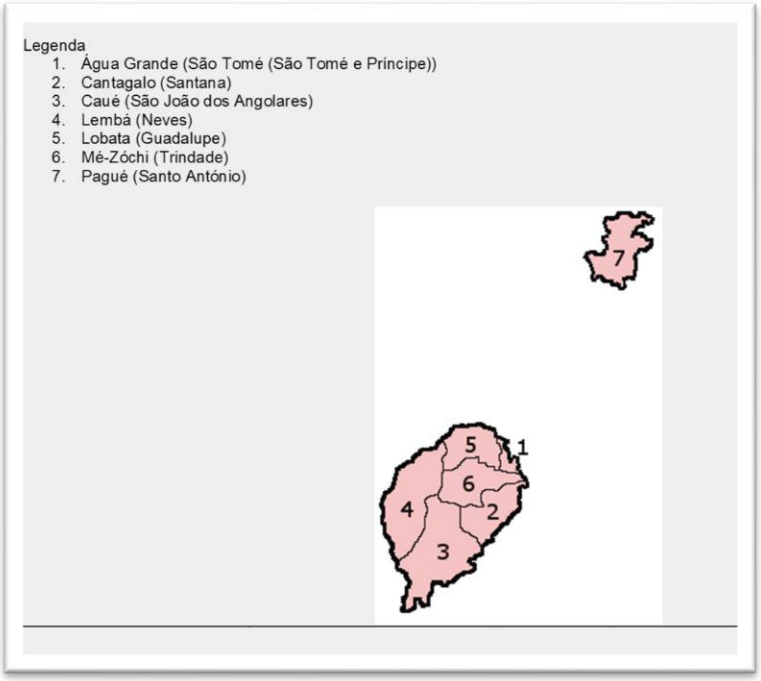


Figure 3-1: Districts of São Tomé and Principe

Sao Tome and Principe GDP per capita income stands at US$ 3,138[7] and the country is in the 143th position in the Human Development Index of the United Nations Development Program (UNDP), which places it at the tail of the least developed countries. These are countries with development index relatively higher than the Low development countries in which three PALOP[8]/CPLP (i.e. Angola, Guinea-Bissau and Mozambique) are placed. The country is relatively well positioned in terms of human development index, especially when considering that for several years it was marked by certain political instability with negative effects on the economic and social development. The political instability seems to be eased now and the future is more promising.

Analysts of socio-economic and political development processes of Sao Tome and Principe recognize that since the country's independence in 1975 it gone through the following main stages:

- 1st Republic, which went from independence in 1975 until 1990, and was marked by a one-party system and centralized/socialist orientation economy. It was during this phase that nationalizations took place in relation to the main productive sectors of the economy, based mainly in the production and export of cocoa. At the final period of this stage decentralization of production systems and of state services began in the form of (i) the establishment of district offices (for education, health, public security, postal services, etc.); (ii) creation of district popular municipalities appointed by the central government and therefore without effective decentralization.
- 2nd Republic extending from 1991 to 2003 marked by political opening, multiparty democracy and market economy. During this phase, among other laws, the Fundamental Law on Local Authorities (Law 10/92), which defines the operation of the municipalities and district assemblies and determines the powers of these

[7] Certain sources estimate that this stands only close to US$ 1.500,00 (CGD, 2014).
[8] Portuguese speaking countries in Africa.

bodies (Article 22: State transfers to authorities) and the respective Law 16/92 of the local Finance, were established.

- 3rd Republic extending from 2003 to the most recent years in which the deepening of multiparty democracy was continued but with strong dosages of governmental instability due to a multitude of factors. It was during this period that the electoral process at the local level came to a relative standstill (e.g. more than 14 years without local elections). These developments shattered important gains made earlier mainly on decentralization and devolution of powers. It also led to a situation of virtual absence of regulation and consequent compliance with laws, etc.

It can be said that in most recent years (last 2-5 years) the country has entered in its 4th stage marked by increased stability and affirmation of the relative strength of democracy and Sao Tome development vision. This phase foretells stability, growth and continued development in which economic and social development, rehabilitation and expansion of basic infrastructure, including transport should be consolidated to sustain an economy and a society that can be expected to witness continued growth and consequently incessant demand for goods and services.

3.2. Road Infrastructures

A considerable part of the country's general infrastructure and real estate was inherited from the colonial period and there has been no significant change in the last more than 40 years. Consequently, these assets are obsolete, undersized for the population and even the economic growth in the period under review, while at the same time inadequately adjusted for the climatic developments strongly influenced by the phenomenon of climate change. This is further made worse by the fact that, due to a combination of factors (human, institutional, economic, financial and technical, etc.), maintenance actions have been inadequate.

The road sector is one of the most affected. As a way of reversing the situation and placing the sector at the center of development processes and stimulating economic growth in the areas of agriculture, fisheries and tourism, the GSTP prepared, in 2012, inter alia, the “Mobility and Inter Municipal Transport Plan of the Island of São Tomé (PMTIIST)”. Among other objectives, it is expected that the Plan will serve as a basis for the preparation of the Transport Master Plan to put in place an integrated transport system and its supporting infrastructures. The formulation of the PMTIIST, which resulted from an extensive consultation process, was done by a multidisciplinary team and provides indications for:

- changing the transport split between public transport and soft transport (pedestrian and cycling), improving the mobility of the population;
- increasing the quality of mobility and the urban environment by increasing synergies that may result from complementarity between different modes of travel;
- improving the functioning of the urban public transport network with the restructuring of the network for a good territorial and temporal coverage;
- increasing the safety, comfort and quality of the priority areas for pedestrians and bicycles and limiting the conditions of use of cars in the most sensitive urban centers;

- improving the current state of traffic by creating objective traffic rules through the introduction of road signs, which will result in the reduction of the number of accidents (with a special focus on motor-cycling transport);
- restructuring the taxi network;
- balancing the allocation of public space to different modes of transport;
- ensuring environmental quality;
- implementing differentiated parking policies, considering the specific needs of residents, employees and visitors;
- obtaining inputs for the São Tomé and Príncipe Transport Master Plan with respect to the Road Transport sub-sector.

While it is true that not all the Plan's measures are of a physical nature, it is a fact that the rehabilitation of EN1 could translate into an important step in materializing part of the objectives and goals pursued by the PMTIIST and in this sense the project is relevant and timely. It has the potential to influence other developments and contribute to new dynamics in Sao Tome's economy and society.

3.3. Climate Change

Despite significant deforestation and forest degradation, STP is not a country that emits greenhouse gases (GHG) at levels that are significant. The country is essentially a carbon sink, i.e. a country where GHG absorption levels are higher than emission levels.

Nevertheless, the country comprises factors that translate into the possibility of a certain degradation of its current condition in the future, if adaptation and mitigation measures are not taken in a timely and decisive manner. As in other developing countries, the poverty levels in which most of the population lives and their heavy dependence on natural resources turns most of the country's inhabitants into agents who present threats to global warming. These are driven by activities such as the extraction of aggregates on beaches and other inadequate areas (por ex. mountain slopes), uncontrolled cutting of trees and fires in which a significant part of the population engages, on a regular basis.

Two sectors of activity, namely Energy and Forests and Land Use Change are responsible for the emission of total Carbon Dioxide, i.e. 163.49 Gg in the country, with the energy sector being the largest emitter with 66, 29 Gg. These emissions result from the combination of the use of firewood and charcoal as the main source of energy as well as the generation of electricity based on fossil sources, which is the main form of energy generation in STP (Second National Communication (SCN) On Climate Change (Ministry of Public Works and Natural Resources/Directorate General for Environment (August 2011)).

Above all, due to its geographical situation, social and economic conditions, STP has high levels of vulnerability to the global climate change phenomenon, mainly in the form of temperature increase, precipitation decrease and sea level rise (slr).

The main sectors and harmful effects for which the country needs to develop adaptation and readiness to respond to are:

- **Agriculture and Livestock**: (i) reduced production because existing crop areas may be reduced due to change of soil and climatic conditions; (ii) increased

incidence of pests that reduce crop yields and the reduction of the number of animals, deaths from excessive parasites in animals from grazing (ticks); (iii) physical and chemical soil change; (Iii) reduction of income in rural areas for farmers and breeders and thus reducing farmers' incomes; and (iv) reduction of the number of animals; deaths from anemia and low consumption of grazing areas.

- **Forest and Soil**: (i) reduction of the forest area in case of prolonged drought; (ii) increase the extent of the Savannah area in the NE of São Tomé island: Practice of indiscriminate slashing and burning of trees and shrubs and coal production (deforestation) in the vicinity and within the Savannas; (iii) proliferation of predatory insects in forest ecosystems; (iv) floods and flooding of forest areas of flat relief; (v) loss of forest cover by landslides; (vi) reduction of soil water content; (vii) progressive soil erosion.
- **Water, Energy and Fisheries**: (i) reduction of groundwater; (ii) reduction of water flows; (iii) increased rate of migration of species; (iv) precipitation excesses, flow increase, flood, natural disasters; (v) reduction of water quality; (vi) reduction in hydroelectric energy production; (vii) reduction in residential energy consumption; (viii) reduction of energy consumption in small industries; (ix) decreased productivity from small industries; (x) loss of biodiversity due to diversion of water currents; (xi) reduction to 50% of the artisanal fisheries production; (xii) reduced discharges of the Niger River in the Atlantic Ocean; (xiii) fishing activity (reduction of fishing effort); (xiv) displacement of fishermen houses in the respective communities due to sea invasion; and (xv) an increase of 0.55 meters of the sea level.

These are already notable and are expected to worsen effects in important sectors such as **Coastal Zone; Population, Health and Education**.

All these areas of vulnerability, especially those related to erosion, sea level rise, water and forests degradation, are of significant relevance to TCP. Of interest to this project is the fact that the above-mentioned report (August 2011) indicates that “the IPCC global forecasts present various scenarios for raising sea level”. There is a scenario (B2) sea level rise, from 0.1 m to 0.65 m by 2100, i.e. about (0.5 m). This means that “bordering housing, hotel infrastructure along the coast and agricultural, banking, insurance, telecommunications and energy activities have the potential to be affected”. On the other hand, the exploitation of aggregates on the beaches of S. Tomé and Príncipe associated with other climatic phenomena that cause coastal erosion, such as winds, precipitation and others, have the potential to engender a retreat from the coastline of 5.2 m per year. The country needs to act, formulate and implement measures of readiness, response and increased resilience to CC.

The response measures include aspects that are related to important TCP project areas such as (i) rehabilitation and recovery of the coastline; (ii) more efficient use of vehicles and in the end expansion of the use of collective transportation; (iii) reforestation, through the application of agroforestry techniques, of the heavily deforested areas that are recommended in the scope of this ESMF; etc.; (iv) any adjustments in land use that the RPF may recommend.

The project needs to strengthen its intention to contribute to reduce vulnerability to climate change and to act so as not to increase such vulnerability while enhancing the country’s resilience to this phenomenon.

3.4. Gender Issues

Gender issues are often highlighted in policy documents that have been prepared and circulated in the country since independence. However, it is noted that the corresponding concrete policy measures are still rare.

Formally the legislation in force in the country promotes equality of rights between men and women, which extends to property rights, legal recognition, marriage and access to economic activities and opportunities. However, in practice discriminatory social standards based on gender identity still prevail and further work still needs to be done to reduce gender disparities, especially regarding women's economic empowerment and access to the labor market. According to the 2012 National Census of Population and Housing, women's unemployment is twice as high as men's (19.7 and 9.3 percent, respectively), and women generally work the most in informal and/or precarious sectors of the economy and society. On the other hand, households headed by single women, which account for 38 per cent of all households, have lower incomes than those headed by men.

More promising developments are occurring in education and governance as the country is close to achieving gender parity in primary education and women's representation in Parliament has been growing.

Using the Road Maintenance Interest Groups (GIMEs) vehicle to provide greater employment and income opportunities, even if it is on a seasonal basis, can make a significant contribution to a gradual gender balance. This is a positive trait of the project that should be encouraged and as much as possible complemented by other measures during construction and operation.

GIMEs were established in the mid-2000s, with European Union (EU) support. These are community associations responsible for road and other related infrastructure maintenance, using a results-based approach while emphasizing intensive work and thereby contributing to the alleviation of the various forms of poverty and vulnerability and the sharing of benefits related to the development of infrastructures in STP. There are 31 GIMEs throughout the country, 27 of which are in S. Tomé island and 4 in the Autonomous Region of Príncipe. They comprise close to 1,310 associates of whom close to 70% are women. The GIMEs are further subdivided into 4 federations (North, Center, South of S. Tomé and the Autonomous Region of Príncipe), which in turn form the National Federation of Road Maintenance (FENAME).

Both FENAME and its associated federations and GIMEs have been proving to be a valid approach in maintaining roads and other low-cost infrastructure whose involvement in TCP is recommended to be pursued. This may be one of the privileged ways to contribute to increasing women's income generation opportunities, sharing the benefits of the project with local people while lowering project costs in the construction and maintenance phases.

4. OVERVIEW OF THE NATURAL AND SOCIAL RECEIVING ENVIRONMENT

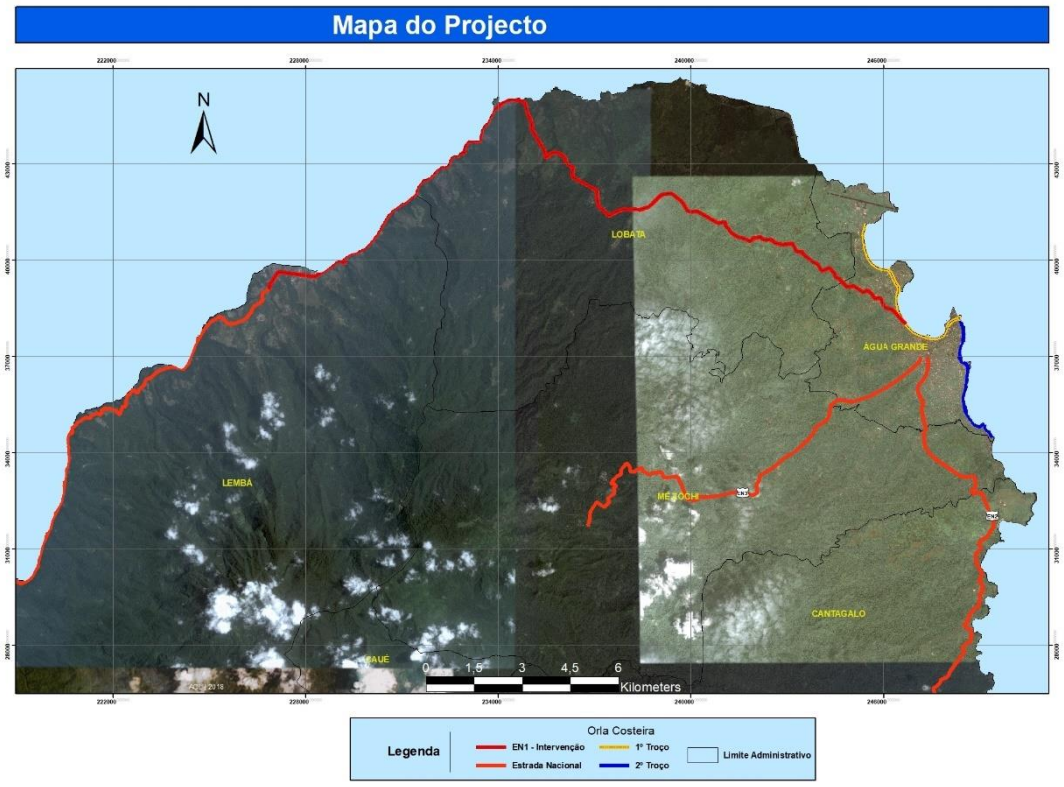
4.1. Project Location

As shown in Figure 4-1, the project is located on the north side of S. Tomé Island and covers both ends of the island, i.e. east and west. It is the most populated area of the archipelago in absolute terms and density. In the North, the districts of Água Grande, Lobata and Lembá the inhabited areas surround the elevated area formed by the conical system defined by the Peak (Pico) of S Tomé and are of relatively low altitude and intense vegetation although not as exuberant as the one that prevails neither at the peak nor on its slopes.

The center-southwest region, which corresponds to approximately 2/3 of the national territory, is very difficult to reach and includes places that are impossible to access. It is known as the hydrographic center, since it is also from there that, the main rivers and water courses that then run radially in all directions to the sea, originate.

S. Tomé and Príncipe is an archipelago, where most of the economic and social infrastructure is in the coastal zone, which translates into a strong pressure on this zone. In a sense, this project has the potential of worsening the existing pressure.

Figure 4-1: The project area



São Tomé and the project area are characterized by the biophysical and socio-economic elements described in the sub-chapters that follow.

4.2. Physical Environment

4.2.1. Geology

Sao Tome displays an elongated configuration (Figure 4-2) in the NE-SW direction, with 46 km of major axis and 34 km from the minor axis aligned with the approximate direction of "Volcanic line of Cameroon" (Henriques & Neto, 2015). Its geology is characterized by volcanic rocks representing four main Volcano-stratigraphic units, according to the recently published map in a 1:25 000 scale: The Formation of Volcanic Islet of Cabras, The Volcanic Complex of Mizambú, The Volcanic Complex of Ribeira Afonso and The Volcanic complex of Sao Tome. According to Caldeira, R. et al. (2013), above these units there are the alluvial deposits and flood deposits (Figure 4-2).

The Volcanic Formation of the Islet of Cabras has an age of 13 Ma and consists of two quartz trachyte chimneys. This is the oldest volcanic formation on the island of Sao Tome. This unit is exclusively represented by two trachytic reliefs, aligned parallel in the direction of the Volcanic Cameroon Line (NW-SE), which constitutes the Islet of Cabras, located NE of the island of Sao Tome. The trachytic materials, considerably weathered, have massive structure cut by a dense network of fractures.

The Mizambú Volcanic Complex, with an age of 6-8 Ma, includes chimneys of phonolite composition, spills of tephritic, basaltic and basanite, locally with marine facies or interlayered with lahar, cut by veins of tephritic and trachyte. As per Caldeira, R. (2013), the volcanic activity that gave rise to this volcanic unit will have begun in the upper Miocene, between 7 to 8 Ma and is represented by volcanic edifice of the central type of Mizambú and Micondó. Compared with the African continent to which they belong the islands are a relatively recent formation.

The Volcanic Complex of Ribeira Afonso (5-2.5 Ma) - is the SE area of the island and is represented by central volcanoes in which phonolite chimneys are remarkable and basaltic, trachytic and phonolitic rocks. The volcanism that originated this unit date back from the Pliocene, aged between 2.5 and 5 Ma, and constitutes the S and SE areas of the island. On the coast, may show submarine facies. Spills are cut by veins with a dominant NW 60º direction. Some pyroclastic typically of ash and flow block represent explosive activity. The reef network and lateritic changes form the separation criteria for the most recent unit.

The Volcanic Complex of S. Tome (<1.5 Ma) forms the northern half and the southern end of the island. It consists of spills and pyroclastic subaerial rocks, basaltic to trachytic phonolitic, interspersed with deposits of strand and lahar. In the N and NW coast marine sequences are found. The newer edifice is Hawaiian cones/strombolian and phreatomagmatic crater preserved forms. To this volcanic unit are associated carbonated springs, hydrocarbon seeps and enclaves of orthoquartzite.

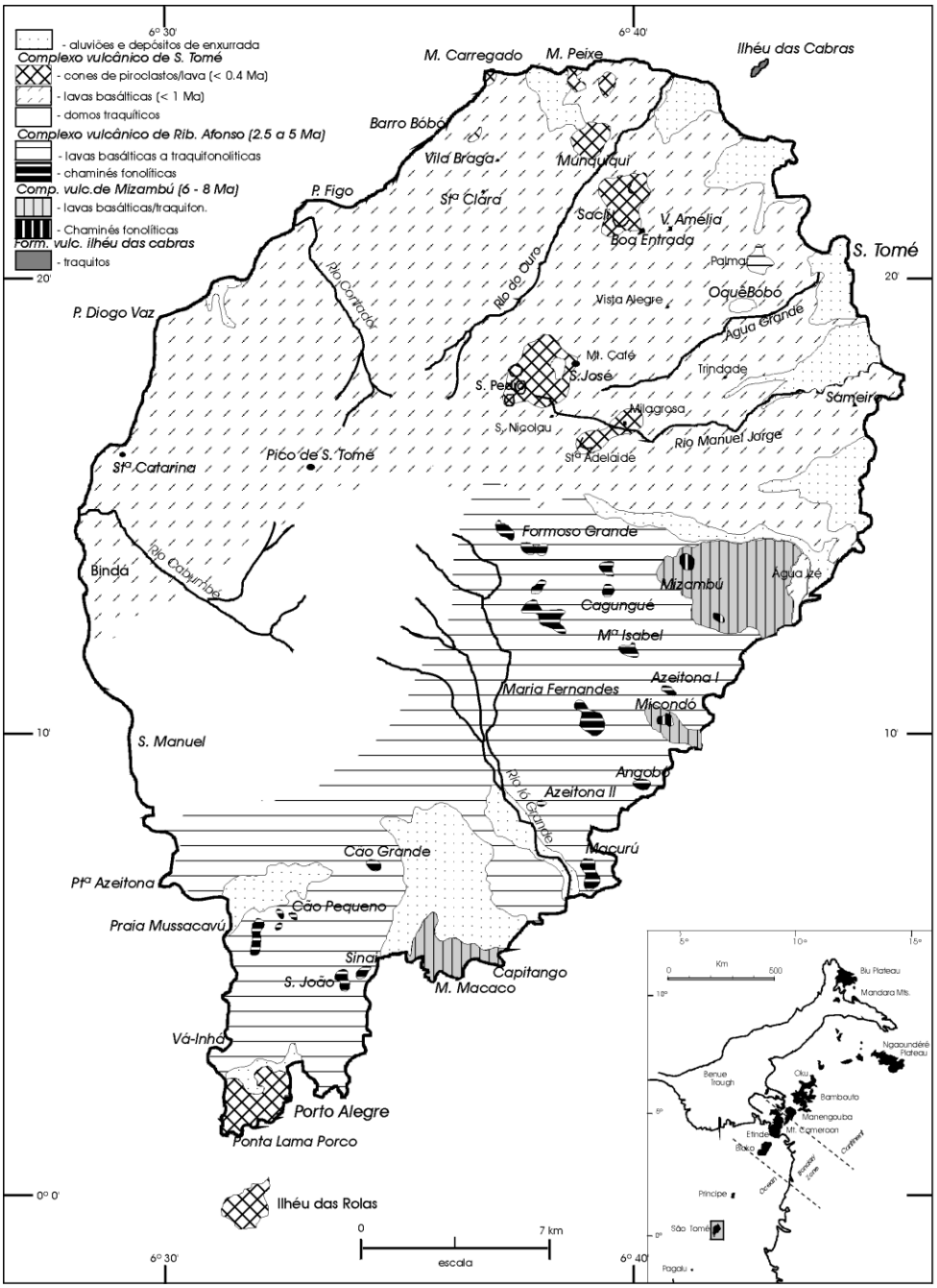


Figure 4-2: Geological Sketch of São Tome (Caldeira, R. et al, 2013.).

Mining activity does not play a significant role in the economy of Sao Tome and Principe. Mineral production is limited to clay and volcanic rocks. There is potential for the development of oil industry. All other needs in mineral products are met through imports (Bermudez-Lugo, O. (2014).

4.2.2. Altitude

The islands of São Tomé and Príncipe are of volcanic origin, with massifs of imposing aspect that, combined with the exuberance of its vegetation cover and the abundance of waterways, give to the islands the unique charm that attracts all its visitors. The main line of elevations of Sao Tome is oriented in the approximate direction of NS in elongated curve with some swell and recess, and is formed by hills or peaks, including the Pico de São Tomé (S Tome Peak), with 2,024 meters above sea level, which has direct links to

the project area. The TCP River and its tributaries, as explained below (hydrology), is attached to this conical system formed by S Tome Peak, that around and from top to bottom concentrates most of the water springs in the island. The peaks of Cão Grande, Cão Pequeno, Maria Fernandes and in the autonomous region of Principe the peaks of Principe and Papagaio are also worth mentioning.

The island of Sao Tome is extremely mountainous, culminating in a sharp escarpment that begins in the crater of an extinct volcano at 1,480 m (Lagoa Amélia) to the São Tomé Peak (2,024 m) and some steep phonolite like Cão Grande (663 m) and Cão Pequeno (390 m), which are very difficult to access. Combined with regular rainfall and abundant water resources these features establish the potential of the country to produce hydroelectric power.

4.2.3. Climate

The islands of Sao Tome and Principe are located along the Equator (they cross the Rolas Island) and about 300 km from the West coast of Africa. The entire archipelago is inserted in the tectonic depression of the volcanic line of Cameroon.

Sao Tome and Principe are volcanic in origin and have an equatorial climate, characterized by being hot and humid type, with average annual temperatures between 22º C and 31º C. It is a country with a multitude of microclimates, defined mainly by rainfall, temperature and location. The temperature varies depending on the altitude and relief.

From the rainfall point of view there are four main seasons in S. Tome and Principe, namely:

1. “Gravana”: that is the great dry season, which lasts from mid-June to mid-September. During this season, the precipitation is very limited, and the flow of watercourses reaches their annual minimum (drought).
2. A rainy season, which runs from mid-September to December, characterized by violent thunderstorms, which give rise to very strong and flash floods.
3. A short dry season (“Gravanita”) between January and February, distinctly less intense than the Gravana itself. During this season the flow of watercourses decreases slightly, without reaching the lowest levels seen in Gravana itself.
4. The second rainy season, from March to mid-June, characterized by violent storms causing extremely strong and flash floods.

During the rainy seasons, the sea reaches temperatures of around 28º C, whereas during the great (Gravana) and small (Gravanita) dry season, when the weather is drier, less rainfall, less heat and humidity, sea temperature goes down a little, but remains in the range of 24 ° C, which is considerably pleasant.

The amount of rainfall increases substantially with altitude. The moist oceanic air masses that are rendered down from the mountains towering in altitude, cool down, and cause heavy rains. There is a positive correlation between altitude and rain.

The influence of prevailing winds is also very striking. Precipitation is stronger in the South slopes and West (which coincides with the project area, especially the west slope) both on the island of Sao Tome as the Principe (3.000 to 5.000 and even 7.000 mm/year) and are limited in the northern and eastern slopes (1.000 to 2.000 mm/year).

Reliable historical data on hydro meteorology are scarce[9] in the country but studies of the regime and inter-annual fluctuation of rainfall on the islands of Sao Tome and Principe prove their enormous regularity, which is due to its location in the immediate vicinity of the Equator. Year on year rainfall patterns are relatively stable. Existing data show that the Gravana always occurs between the months of June and September, and in other months the rains are intense. Reportedly 1983 was an exceptional year, characterized by a longer Gravana and reduced rainfall. The drought impacted negatively on food production and the country was forced to resort to international food aid. It is a rare phenomenon (which is reported to have occurred only once in a century), although it is generally accepted that it is likely to happen again.

Throughout the year, 1.760 hours of sunshine occurring, which goes down to 1.300 hours in altitudes between 500 and 1.000 meters.

Figure 4-3, below, shows the rainfall details and temperatures observed in São Tome and Principe archipelago over a year.

[9] The station at the Airport was reported as being the only one with a continuous rainfall data for the last 50 years.

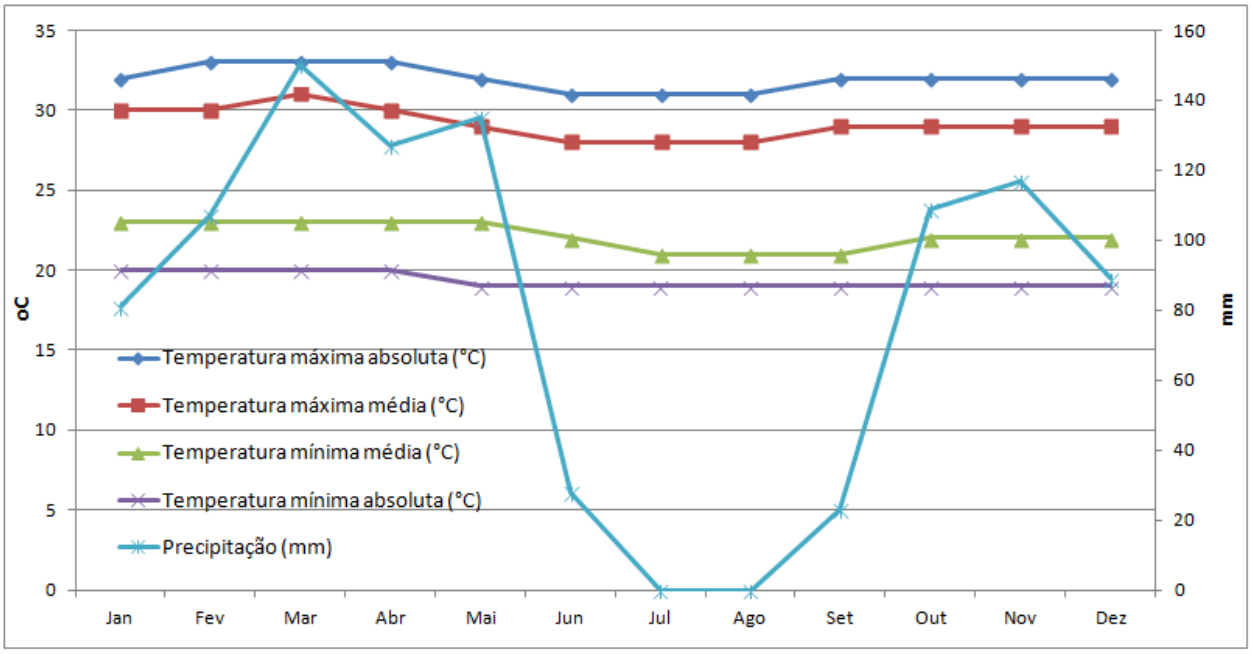


Figure 4-3: Precipitation and temperatures observed in the Sao Tome and Principe archipelago.

4.2.4. Soils

The relief is mountainous, with deep valleys, and the highest point on the island of São Tomé is situated 2,024 meters above sea level and 948 m in Principe Island. The islands are based on volcanic soil, of clay type and generally rich in organic matter (Jesus, 1998) and a high potential for moisture retention and thus very responsive to agriculture and growth of a variety of plants.

The country soils are considerably fertile, according to MIS data (Mauritius Implementation Strategy). The types of soils found in the country are lateritic, soils that are relatively poor in organic matter and slightly acidic or neutral, alluvial soils and black clays.

4.2.5. Hydrology

The climatic conditions of the islands of Sao Tome and Principe characterize their water resources as excellent, although not properly used. The regime of watercourses is irregular, which is related to the distribution of rainfall by zones and seasons. The waterways in the country get on its total surface about 2.1 million cubic meters of water/km/year, equivalent to about 10,000 per year/inhabitant m^3. The amount of water available per capita is relatively high compared to other regions of the world, especially with the rest of sub-Saharan Africa (Aguiar, 2000).

The waters are controlled by unpredictable relief of the islands, especially in São Tomé and Pico (Peak) of the same name. At times they form admirable beautiful picturesque waterfalls. Many rivers and streams that run on the islands are called “águas” (waters) by the locals. Such is the case of Água Grande, Água Izé, Água Abade and others. The hydrographic network of Sao Tome and Principe is made up of over 50 waterways with a length of between 5 and 27km (Bomfim, 2002). More than 60% of the flow of these rivers is in the southwestern part of the island of Sao Tome. Almost all the rivers of São Tomé originate inside the Obô S. Tome PNOST National Park (established in 2006 by Law 6/2006) and most of its middle and high traits develop in the Park.

São Tomé's main waterways are: The Iô Grande River, which originate from Mount Calvário, in Caué district, which discharges on the beach Lô Grande after 24 km; Abade River also originates from Mount Calvário, with a 22 km extension and as a waterfall that offers good possibilities for power production; the Manuel Jorge River, originates in the lagoon Amelia and after traveling 21 km flows into the town of Melon Beach; the Golden River, also originates from Amelia Laggon, which due to unevenness during its 19 km course crashes in several cascades of which Boa Esperança (Good Hope) deserve special mention; The Água Grande River, which by its flow, is the most important of the country's waterways runs through the city of São Tomé and, some kilometers before the city, has the well-known and beautiful waterfall of Blu-Blu located in the area of Madre Deus. There is also the Rio TCP. Figure 4-2 (Geological map of São Tome) shows the location of these rivers.

Figure 4-4: A bridge over Provaz river

Eight bridges and platforms were counted along the EN1, two in the district of Água Grande, 5 in Lobata and 2 in Lembá, which cross an equal number of watercourses.

4.2.6. Important Physical Environment Traits in the Project Area

Relief determines the climatic conditions, rainfall, hydrology, soils and ultimately vegetation and by extension the fauna and human settlements in a region, as will be described below.

In summary relief in S Tomé Island has very irregular shapes. In the western half of the island, in the NW and SW direction, which extends to Lembá district, the terrain is rough towards the coast. The highest points are above the 1.800 to 2.000 m and intermediate between 1.000 to 1.800 m and finally the lowest, closer to the coast, between 0 and 800 m. In the eastern half of the NE and SE direction, the landforms are softer, and slightly inclined to the ocean, mainly in Água Izé range to Plancas limited by the line of the coast and the curve of 300-400 meters altitude. In the SE direction and the South flatlands are observed in the areas of Ribeira Peixe and Porto Alegre.

The lowest areas are those that contain the highest concentrations of human settlements and their activities, hence the high population densities in the three districts (Água Grande, Lobata and Lembá) and their respective urban centers in the project area, i.e. S. Tomé, Guadalupe and Neves. These densities decrease as the altitude increases until they are almost nil at the highest points. It is this almost uninhabited and free state of human activity that determined the establishment in 2006 of PNOST, i.e. in the intermediate and elevated elevation zones, where the buffer zones and central part of the Park are located. The purpose of the establishment of the Park is to protect the forest areas around the São Tomé Peak (19,500 ha) and its representative ecosystems (forest, coastal and marine).

The three districts and urban areas of the project area lie in the coastal and elevation zone between 0-800 m, although it is true that the stretch of the S. Tomé-Guadalupe road is in a more inland area than the Guadalupe-Neves section and the coast of the city of S. Tomé, which will also be subject to rehabilitation.

The physiographic aspects are comfortable for settlements and human activities between S. Tomé and Guadalupe and in Neves itself, which are relatively lower zones. In Neves the inhabited area is formed by a small strip of land between the mountains of Pico de S Tomé and the sea and for this reason it is a very congested urban area and seriously under the influence of torrential waters, sludge and other elements during the intense rainy season. These descend the slope towards the sea after passing through Neves and require appropriate management systems. To a degree, with a centuries-old tradition of increasing resilience to climatic adversities, a considerable proportion of local people build their homes in height, raising them on sustaining wood and other lifting materials so that rainwater and other elements may flow freely towards the sea (Figure 4-5).

Figure 4-5: Elevated house in Neves for protection against storms

Municipal and road authorities have established drainage systems along several roads, including along EN1. But in almost all cases, currently, these are in an advanced state of degradation due to lack of structural investments and maintenance deficiencies (Figure 4-6).

Figure 4-6: Storm water drainage in Neves showing degradation

Between Guadeloupe and Neves (moving to Neves) what is noticeable is that on the right side the sea/ocean itself predominates and from the left the mountains and their slopes. From the slopes the risks of sliding rocks and other materials are evident and to increase road safety it is urgent to adopt protection measures selected from several options that can serve and/or combine many structural (e.g. slope restructuring, drainage, coating, etc.) and non-structural (e.g. plant covers) measures.

In addition to slope differences, i.e. steeper and more gradual slopes, the different points on the slopes present different levels of slip risk, with emphasis on (i) areas consolidated by vegetation and with a lower level of risk; (ii) areas consolidated by structural works (with emphasis on cemented stone) carried out at different times, especially those done during the colonial period; and (iii) unprotected areas due to the combination of various natural and anthropogenic factors (e.g. stone and coal making on slopes). These points should be the object of inventory and design of management and protection measures.

The Figures below show the different facets of the slopes along the EN1 between Guadalupe and Neves and mainly closer to Neves.

Figure 4-7: Slope relatively stabilized by vegetation cover

Figure 4-8: Slope stabilized using local stones and cement


TOYOTA

Figure 4-9: Unprotected and eroded slope (coal making)

Figure 4-10: Unprotected slope (stone extraction)

Figure 4-11: A dangerous slope (combination of causes)

As for the coastal zone, both in the city of S Tome and in the Guadalupe-Neves section, there are also different forms of protection, especially structural works (walls and dikes), most of which are in a damaged state mostly due to poor maintenance. In this case also, differentiated interventions will also be necessary after a detailed inventory and assessment.

4.3. Biological Environment

4.3.1. Overview

Despite its relatively small size due to its configuration (more than 290 km of coastline), altitude, climate and microclimates, soils, etc. Sao Tome and Principe is rich in diversity of ecosystems in the form of forests, mangrove forests, inland waters and coastal and marine ecosystems, many of which are in their typical pristine condition. Notwithstanding this situation, human interference has contributed since the Portuguese occupation in the fifteenth century to lend to the natural landscape substantial changes that resulted in secondary forests and old plantations (especially cocoa, coffee, banana, etc.), shade forests, savannahs and dry forests.

Forest ecosystems on the island play an important role in biodiversity and livelihoods of the inhabitants. Both in Sao Tome and Principe and the rest of the world, tropical forests are vital for biodiversity and conservation and are also important in controlling climate change.

Forests are one of the most complex natural ecosystems, with considerable influence on the quality of environmental components such as air, water, soil, climate and different forms of life and biodiversity in general. They also have a strong bearing on recreation, landscape scenery and the general well-being of humans and other species. The health of the environment in general has strong relationships with forests in vast and complex ways.

Forests improve the environment in different ways, such as: (i) relative humidity of the air that is increased; (ii) increased soil fertility due to the addition of large quantities of organic matter in the soil, increasing the water retention capacity and soil nutrients; (iii) prevent soil erosion; (iv) increase the capacity of surface water to infiltrate groundwater; (v) the quality and diversity of wild and domestic animals, including humans.

As the forest sets in and develops, the very place where it occurs undergoes changes. Forest cover moderates the regime of extreme temperatures in daylight from open locations, resulting in more uniform conditions. Wind speed is slowed near the treetops and becomes insignificant within the forest. Treetops intercept sunlight and alter the amount and quality of radiation that reaches the forest floor in comparison to that which reaches open places. In the forest soil, accumulated layers of leaves, branches and other debris attract a characteristic group of plants and animals that live off the decomposing organic matter of one another.

Mangrove forests have proven to be of great use in Africa as support elements to address climate variations by providing the first barrier of protection to hinterland elements in the event of extreme events such as rising sea level, winds, cyclones and even tsunamis (tidal waves caused by earthquakes in seas and oceans). Mangrove forests also constitute important nurseries for a variety of terrestrial, marine and fresh water species.

The conservation of forest mantles is equally important to the practice of agriculture in tropical climates. The forest cover contributes to the control of precipitation, evapotranspiration, erosion control, and nutrient recycling and soil fertility maintenance.

After many years of concentration on the influence of forests on climate at the microclimate or local level, in recent times, there is increasing attention to the potential impact of forests on global conditions. Forests have the potential to contribute to climate change through their influence on the global carbon cycle. The forest is being recognized as playing important roles in the global biochemical cycle. The main carbon reservoirs are the atmosphere, fossil fuels, oceans and the terrestrial biota and the soil.

4.3.2. Terrestrial Ecology

The two islands are part of the West Africa sub region related to the Congo River basin, which contains high levels of endemism. The two main islands of the archipelago, i.e. Sao Tome and Principe are characterized by an endemism rate set at 14%, which is the highest in the Gulf of Guinea. This makes São Tomé and Principe one of the richest countries in natural capital.

4.3.2.1. Flora

Both vegetation and fauna and even human settlements and related activities have strong relationships with the altitude so that in São Tomé the following ecological regions especially from the forestry point of view are distinguished, namely **(i) primary forest altitude, located on the top of S Tome Peak; (Ii) altitude forest> 1800 and <2000 m; (iii) altitude forest> 1000 and <1800m; (iv) low-altitude forest ≤ 0-800 m; (V) Dry forest of neighboring regions of Água Castelo, Água Guadalupe, Rio Ouro; (vi) Mangrove of the lower coast or lagoon areas; and (vii) rain forest, of low mountain.** Briefly these types of vegetation are characterized by:

1. Altitude Primary Forest

Misty forest surrounding regions around the Pico de São Tomé and Pico Pequeno. It is characterized by the presence of *Podocarpus mannii* (Pinheiro São Tomé), the only endemic gymnospermy in the archipelago, *Phylippia thomensis* and *Lobelia barnsii* (giant lobelia). The latter are found only in isolated areas of the Peak (Olive, 2002). Orchids, ferns, mosses and lichens are also recurrent. The most abundant tree in the misty forest are *Allophyllus africanus* (pau-três), *Homalium henriquensii* (quebra machado), *pauridiantha floribunda* (pau formiga), *African Pseudogrostistachys* (Obô cocoa), *rothmannia urcelliformis* (teiateia) *Tabernaemontana stenosiphon* (cata-Obô) and *Trichilia grandifolia* (cola acaco).

Altitude forest > 1800 and < 2000m present in Mesa do Pico (Peak) zone, Pico Ana Chaves associated with very high rainfall, with almost constant fog, usually low temperature for the S Tome context, although these never reach 0 ° C. The trees are very low, and epiphytes are numerous. The endemic plants of the islands from the Gulf of Guinea that appear at this altitude are *Calvoa crassinoda*, *Croton stelluliferus*, *Erica thomensis*, *Homalium henriquesii*, *Lobelia barnsii*, *Peddiea thomensis* (tchapo-tchapo d'Obô), *manniana Pilea*, *Podocarpus mannii* (pine of -are Tome), *Polyscias quintasii*, *guerkeana Psychotria* and *P. nubicola*. Ferns, mosses and lichens are also frequent (Oliveira, 2002).

Altitude Forest > 1000 to < 1800m, which is a mountain vegetation formation surrounding the Cabumbé Peak, in the gradual transition area between the boundaries of crops and dense forest areas with average minimum temperature variations, while the rainfall and relative humidity increase. This vegetation is highly conserved and is characterized by a relatively high number of species in a very limited space dominated by *Rubiaceae* and *Euphorbiaceae*, the absence or low numbers of *Fabaceae* and *Asteraceae* including considerable abundance of epiphytes, particularly Orchidaceae and mosses. The arboreal layer is characterized by the following tree species: *Craterispermum montanum* (macambrará) *iscoclaoxyllum occidentale* (quina n.º 2), *erythrococca molleri* (coedano) *pavetta monticola*, *Tabernaemontana stenosiphon* (cata d'Obô) and *Trichilia grandifolia* (cacau d'Obô). The understory is dominated by the following endemic species: *Begonia baccata*, *crassinoda Calvoa*, *Cyperus sylvicola*, *buccinalis Impatiens*, *I. thomensis*, *mapania ferruginea*, *palisota pedicellata*, *Sabicea ingrata* and *S. exellii* and *Syzygium Guinea*. The crater of Lagoa Amelia also falls into this vegetation type, characterized by a very particular vegetation formation, hosting a vegetation composed of a herbaceous perennial mantle of *Panicum brevifolium* and *P. hochstetteri* also with a significant presence of *Cyperus articulatus*, *Polygonum salicifoluium*, *Tristemma mauritianum* and a lot of fetuses of *Polypodiácea Hymenofoliácea* family as well as rare orchids (*Bulbophyllum cocleatum var*. *Tenuicaule*, *Dinklagella liberica* and *Solenangis clavata*). Small shrubs such as *Heteradelphia paulowilhelmia*, *Melonophoeos Rapanea* and *Schefflera mannii*.

2. Forest of low altitude

Lowland forest (≤ 0-800 m) corresponding to the region of low altitude rainforest (Exell, 1944). It lies between the coast and 800m altitude. It's a markedly more cultivated area, or "sidelined", except perhaps for small extremities of South Forest Island. The predominant characteristic species coincide with those mentioned above.

Shrub, tree and herbaceous savannas that is favored by several factors (Rollet (1964), in Begue, 1967)), such as: (i) soil poverty and its permeability; (ii) frequency of fires; and (iii) density. Based on these considerations, Rollet highlights the importance of the anthropogenic factors in the genesis of these savannas. These environments are probably the result of the devastations of the original vegetation made for the

establishment of crops during the phase of sugarcane growing in the early days of Portuguese colonization. The vegetation is characterized by a sparse floristic richness and the high number of introduced species. This soil and climate formation occupies a strip that surrounds the coastline of Sao Tome and extends for a variable width from the airport to the beach of Roca das Conchas and Lagoa Azul (encompassing regions around Conde, and between the banks of Água Castelo and Água Guadalupe and Mutamba Mountain). Important part of this land area is included within the boundaries of PNOST in Praia das Conchas area. These are areas of a semi-arid or arid climate, with less rainfall at 700mm/year, even reaching 500mm/year and an average temperature of around 26 ° C. The water resources are relatively scarce, with only a few lines of water. The soils are of dark or black earth, poor topsoil, sometimes with rocky outcrops and compact underground. According to Oliveira (2002), the dominant trees and shrub species in this formation are: *Adansonia digitata* (micondó), *Borassus aethiopum* (ulua) *Erythroxyllum emariginatumo* (libo), *Psidium guajava* (guéva), *Tamarindus indica* (tamanho), *Vernonia amygdalina* (mucambú), *Ximenia americana* (limonplé) and *Ziziphus abissinica* (zimbrão). The herbaceous vegetation is dominated by *Heteropogon contortus*, *Panicum maximum* and *Rottboellia exaltata*, but the floristic panorama also includes botanicals that are part of halophiles groups germinans *Avicennia* and *Rhizophora racemosa*. In less pronounced salinity zones there are *Dalbergia ecastaphyllum*, *Erythroxyllum emarginatum* and *Hibiscus tiliaceus*.

Dry forest is in a plant formation that occupies the neighboring regions of Guadalupe, comprising the banks of Água Castelo, Água de Guadalupe, and Rio de Ouro and is predominant on areas with rainfall between 1,000 and 1,500 mm per year, with a well-defined dry period (Oliveira, 2002). Some marginal areas of this vegetation type are included in the northern part of PNOST (Praia das Conchas area). The highest layer of this formation is made up of deciduous trees such as *Ficus mucuso*, *Milicia excelsa* and *Spondias microcarpa*. In the understory are shrubs (threatened by fires, common in this area) such as *Oncoba spinosa* (malimboque) and *Ophiobotrys zenkeri* (stala-stala).

Mangrove that develops in the low areas of the coast or lagoon areas such as river mouths near Praia das Conchas and around Porto Alegre and Lagoa Malanza (which is the largest mangrove in the country). Mangroves are generally influenced by the continuous salinity fluctuations caused by evaporation and the tropical rains and have an important role in fish protection in the early stages of development and control of coastal erosion. This vegetation is dominated by two species, namely: *Avicennia germinans* and *Rhizophora mangle*. The second is predominant on the peat deposits and dominates the lower parts of the intertidal zone not only thanks to its roots, but also because most of the plants of this species resist better to the conditions of an adverse environment for most plants. The *Avicennia germinans* is dominant in some shallow water areas that are formed due to tidal movement. This species has a higher salt tolerance than *R. mangle*. The vegetation is also characterized by the abundance of *Acrostichum aureum* and some *cyperaceaes* (Sleria depressa) (CEAS 1999). The biological richness of the mangrove raises concerns about the risk that the biodiversity of this delicate environment will get lost because of human action. The recovery of a mangrove tends to be difficult if not impossible. Shrubs slashing can induce irreversible changes in ecosystem structure. It may happen that the cutting of Avicenias favors the expansion of shrub and herbaceous species that tolerate high salinity, thus reducing the space available for the same *Avicenias* whose reproduction is very slow. On the other hand, the cutting of *Rizhophora* may facilitate soil erosion caused by the tide and wind, which may hinder the germination of new mangrove plants. The cutting of mangrove trees is also harmful because of seeds and the plants germinate and grow best in the shade than in the presence of light (Oliveira, 2002). The mangrove is an extremely delicate ecosystem, deserving special attention for their conservation.

There are also other vegetation classifications such as the Lains Silva (1958), which is slightly different from the one above and that divides the Sao Tome forest into four main types: 1**. tropical, between 0 and 300 meters above sea level**; **2. subtropical, between 300 and 1,500 meters of altitude**; **3. Low mountain, between 1,500 and 1.900m of altitude**; **4. high mountain, between 1.900 and 2.024m of altitude**. The latter is perhaps more practical for the interests of this document and at this early stage of the studies.

The list of endemic plants on both islands comprises 148 endemic taxa, of which 123 are in São Tomé and 50 in Principe. The preservation of these 148 endemic taxa was evaluated as follows: (i) 14.9% are considered extinct; (ii) 12.8% are seriously threatened; (iii) 10.8% are threatened; (iv) 41.9% are vulnerable; (v) 12.2% are almost at risk; and (vi) 7.4% raise less concern (GSTP, 2007).

In the context of sustainable development policies and policies embraced by the country for more than two decades since the Rio Conference in 1992, Sao Tome authorities want to see the situation described above regarding the extinction of plant species reversed or at least not worsened. This implies strict compliance with the set of laws and regulations and other sound management instruments of natural resources in the country by all the actors involved in development initiatives including public, private and civil society sectors as well as micro, small and medium producers and family sector farmers.

On the island of São Tomé 46% of the species in areas not protected were considered extinct, 41% in the buffer zone around the Park Obo, which has intersecting areas with the project area are threatened and may disappear if no action is taken, and 39% of threatened species are located within the Obô Park.

4.3.2.2 Fauna

Based on occurrence in PNOST, which can be considered as the most representative area of the natural setting of Sao Tome Island, it stands out that endemism levels are high in all terrestrial vertebrate groups. Overall, except for avifauna S Tome is relatively endowed in terms of absolute number of indigenous species, compared with areas (mostly protected) of equivalent extension in the mainland. This seems to be the result of the insular character of São Tomé and prolonged separation of the island from the African continent and seen from the perspective of conservation, constitutes an added challenge to the authorities and all other stakeholders active in the protection of the country's natural heritage. In very broad terms below are presented the general characteristics of faunal species in S. Tome and Principe, Sao Tome and particularly in and around the PNOST.

Mammals

In Sao Tome and Principe there are 11 native species of land mammals, 6 species introduced and 8 domestic species. Dutton (1994) states that some of the species of the last two types can pose a threat to native fauna of the islands, namely: pigs, goats, cattle, sheep, but especially cats and dogs. Existing data indicate that horses and donkeys have practically disappeared with only one individual on the islands for horses and donkeys being reduced to a minimum number of animals (<5).

All goes to show that at the time of discovery of the islands in the fifteenth century there were no larger mammal populations, and these had to be imported or introduced at different periods (Exell 1956) and different points. Today, the territory of PNOST is home to stable populations of introduced mammal species. One of the best known and most

common species is of the *Cercopithecus mona* primate populations that have spread throughout the country. In Sao Tome there are also populations of cats and wild pigs, rats (*Rattus rattus and R. norvegicus*), house mice (*Mus musculus*) (Bocage, 1903; 1904; Frade, 1958) and carnivores like the African civet *Civettictis civetta* and the great weasel od Iberian race *Mustela nivalis numidica*, the two probably introduced to combat rodents in agricultural areas (Bocage, 1903; Frade, 1958).

The native fauna of mammals of the island of Sao Tome is constituted only by species of bats and insectivores. The territory of PNOST houses populations of an endemic species of shrew *Crocidura thomensis* (Heim Balsac & Hutterer, 1982; Dutton & Haft, 1996) and ten species of bats namely: fruit bats *Eidolon helvum*, *Myonycteris brachycephala* e *Rousettus aegyptiacus* and insectivorous bats *Chaerephon pumila*, *Hipposideros commersoni*, *H. ruber*, *Miniopterus minor*, *M. newtoni*, *Tadarida tomensis* e *Taphozous mauritianus* (Juste & Ibañez, 1994). Similarly, for the other groups of terrestrial vertebrates, including for bats the level of endemism is considerable. The group includes two endemic species (*Fijian tomensis and myonycteris brachycephala*) and three endemic subspecies (*Egyptian fruit bat thomensis, Hipposideros commersoni thomensis and Miniopterus minor newtoni*).

The shrew *Crocidura thomensis* and two species of bats (*Tadarida tomensis and myonycteris brachycephala*) are included in the IUCN Red List (2008). To these are added, according to experts at IUCN: a species considered "near threatened" (Straw-Coloured Fruit Bat/*Eidolon helvum*) and two species of *Miniopterus* with an "undetermined" status due to limited information on their populations.

Avifauna

Of all the São-Tomé fauna, birds constitute the animal group whose ecology and conservation status are the best known. The studies on this group date back from the XVII, XVIII and XIX centuries and extend to more recent times involving institutions and experts from different parts of the world, under well identified expeditions.

Recent expeditions rediscovered two endemic species considered extinct birds that include: *Bostrychia bocagei* and *Lanius newtoni*. Another expedition (Sargeant et al., 1992) also was rediscovered the presence of *Neospiza concolor* after more than one hundred years without records. Most ornithological expeditions on the island of São Tomé in the 1990s and early years of this century, were developed mainly under the ECOFAC Programme (Christy & Clarke, 1998). In recent years there is still an evident interest for the Archipelago and the territory of the Natural Parks by professional ornithologists.

The importance of Sao Tome and Principe forests for the conservation of biodiversity of birds in the international context has been clearly underlined by the Collar & Stuart work (1985). These authors classified the rain forests of the archipelago as the most important the 2nd among the 75 forests of Africa considered.

Sao Tome and Principe also has five IBAs (Important Bird Areas) in the classification system adopted by Bird Life International (Bird Life International, 2008). Three of IBA are within the PNOST.

According to different authors (Dallimer et al., 2002; Olmos & Turshak, in press) the number of endemic terrestrial birds of Sao Tome and Principe varies between 21 and 28. This number of endemism is like the equivalent index for the Galapagos Archipelago (22 species), which is eight times larger than Sao Tome and Principe and is more than

double the same index for Seychelles (11 species), which are of a slightly smaller size than Sao Tome and Principe. Sao Tome houses three mono-specific genera (*Amaurocichla*, *Dreptes* and *Neospiza*) and more than 50 species that nest on the island, fifteen are endemic to São Tomé and five are endemics shared with Principe (one of five species is also present in Annobón) (Jones & Tye, 2006).

Reptiles

Excluding sea turtles, Sao Tome houses fourteen species of reptiles. These species have an overlap between the distribution area and the territory of PNOST, or its buffer zone. Seven of these species are endemic to Sao Tome and Principe (a kind also lies in Annobón).

The species detailed below inhabit the waters of the country and use the beaches of PNOST and its Buffer Zone for reproduction and are of a value on conservation with national interest and beyond the country's borders. These are: *Eretmochelys imbricata*, best known as "sada turtle". It is the most sought after due to the high value of its shell in the manufacture of handicraft items. It frequently uses the beaches of the southern part of the Park and Buffer Zone of the island of Sao Tome for reproduction; *leatherback Dermochelys*, commonly known as "turtle ambulance", is the rarest in the country's waters. More often It also uses the beaches of the southern area of PNOST and the Buffer Zone of the island of Sao Tome for reproduction; *Lepydochelys olivácea*, better known as "bastard turtle" or "Tato" prevails in the country's waters and use the northern beaches of the island of Sao Tome (including beaches inside the PNOST) to spawn. Its carapace is not used but the eggs are highly appreciated by the population. It is undergoing a sharp population decline compared with other species, since it is smaller in size and therefore more easily transportable by poachers; *Chelonia mydas*, which is better known as "white hand turtle" very common in São Tomé beaches. The eggs and meat are highly appreciated. Currently it should be more abundant than the previous species; *Caretta*, which is best known as "big-headed turtle", for which there are no recent records of nesting in the Archipelago.

Amphibians

There are five species associated with the island of São Tomé (Loumont, 1992; Nussbaum & Pfrender, 1998), three of which are endemic to São Tomé, namely: *Ptychadena newtoni*, *Schistometopum thomense* and *Hyperolius thomensis* previously classified in endemic genus (*Nesionixalus*) but recently it received a redefinition of its systematic status (Drewes & Wilkinson, 2004). The other two species are endemic and shared with the island of Principe, i.e. *Hyperolius molleri* (formerly this was also classified in the genus *Nesionixalus*) and *Phrynobatrachus díspar*. The understanding of the dispersion model of these amphibian species remains unclear given that it is made of intolerant animals to salt water, which explains why they could not have colonized the island through a passage in the ocean waters. The *Schistometopum gimnofionide thomense* is the only known case in the world of a dispersion of a species of this group by a marine barrier. A recent study (Measey, 2003) showed how this species is not affected by agricultural activities, but on the contrary, seems to bring an advantage to them, given the low use of agrochemicals in many agricultural areas in São Tomé. Two of the cited species are included in the IUCN Red List (2008), namely: *Hyperolius thomensis* and *Ptychadena newtoni*, and the two are classified as "Endangered".

Fishes

In fresh and brackish waters small fish predominate, among others, *Eleotris vittata* (charoco) and *Pomadasys jubelini* (ENPAB, 2002) can be found.

Studies conducted between 1993 and 1996, identified about 105 species inherent to the waters of São Tomé and Principe; of these, 88 had commercial value. The Family Carangidae, Serranidae, Sparidae, Scmobridae with 11, 9, 8, 7 and species used, which are the most fished. Afonso et al. (1999) established at 185 the number of species of coastal marine fish in Sao Tome and Principe, distributed in 67 families. 156 of these species are considered to be of commercial interest. A more recent study (Wirtz et al., 2007) increased to 244 this number, of which 28 are endemic species of the Gulf of Guinea (12% of endemism rate). Given the strong tradition of sea fish catch associated with its abundance and accessibility (the whole ofl Sao Tome is situated more or less close to the sea), which contrasts with the little known and significantly less abundant and difficult to access freswater fish, the fishing of the latter is almost nonexistent in STP. In the project area it can be said that is almost non-existent.

Arthropods

Studies on the invertebrate fauna of PNOST and the island of Sao Tome, are more necessary than for any other animal or plant group, for there to be a greater knowledge of their occurrence and behavior.

In 1995, Gascogine prepared a Red List of endangered species of Sao Tome and Principe. The same consists of four species/subspecies of *Lepidopteros* present in São Tomé that should already be “Extinct”, but this cannot be said for sure: *Epamera bellina maris* and *Charaxes defulvata*; “Endangered”: *Graphium leonidas thomasius*; “Vulnerable”: *Coeliades bocagii*. In the area of Praia das Conchas, there are *Graphium leonidas thomasius* and *Coeliades bocagii* (Oliveira, 2002). The endemic butterfly *Defulvata genus*, which was last seen in 1926 and is now considered extinct, is usually quoted in a special way. Other species of butterflies (not endangered) and marked are *Dixeia piscicollis* and *Neptis eltringhami*. All these species are at risk due to fires caused by both the practice of burning for preparing land for cultivation as for spontaneous fires in the dry season. The *Apis* bees produce honey and play a very important role in pollination, fertilization of flowering plants, thus, contributing to the conservation of forest areas. Some protected species of “centipedes” such as *Globanus diplopodas integer* and *Blobunus marginescaber* also belong to the fauna of PNOST (Oliveira, 2002).

Mollusks

The endemic giant whelk *Archachatina bicarinata* is the most representative species of this animal group. Locally is called the “black whelk” or “terrestrial whelk”. It is widely used in local food by the people and enjoys high appreciation. Numbers have been recording progressive decrease and the species is classified in the IUCN Red List (2008) with the status of “Vulnerable”. In addition to this species, Gascogine (1995), also classified in the Red List of endangered species of Sao Tome and Principe, *Thyrophorella thomensis* (“Endangered”). Among the other terrestrial and freshwater molluscs the presence of molluscs such as *Bulinus forskalii* and *Neritina afra* (caramuso) should also be highlighted.

Risk of loss of fauna biodiversity

The risk of fauna biodiversity loss on the island of Sao Tome seems concrete. The PNOST is the exclusive territory of most species included in the IUCN Red List (2008).

Table 4-1, below, presents an analysis of the occurrences and levels of endemism in the two main islands and territory. Studies refer to a progressive worsening of the general situation of endangered species in the period between 1988 and 2004, indicating that there was a small decrease in the average level of threat of the species between 2004 and 2008.

Species Richness and Endemism among the Groups of Fauna in Sao Tome and Principe			
Species	**Islands**	**Number of Species**	**Endemism (%)**
Mammals	São Tomé	10	30
	Príncipe	5	20
Bats	São Tomé	9	55
	Príncipe	4	50
Birds	São Tomé	49	20
	Príncipe	35	8
Reptiles	Country's Total	16	44
Amphibians	São Tomé	6	100
	Príncipe	3	100
Butterflies	São Tomé	47	38
	Príncipe	42	21
Mollusks	São Tomé	39	77
	Príncipe	32	78
Higher plants	Country's Total	895	15

Table 4-1: Animal and plant species and endemism in STP

4.3.3. Important Biological Environment Traits in the Project Area

From a biotic point of view, and especially of the flora, the whole project area is mainly on the substrate of the low altitude forest (≤ 0 - 800 m), which lies between the coast and 800m altitude and is in fact the most cultivated, or "anthropogenically" developed. It is in it that the bush-tree and herbaceous savannas abound in the dry Forest and along the coast, especially in Neves, in this case, Mangrove forest.

Although still maintaining significant exuberance of plantations that will be better described in the subchapter of social characterization (below), the urbanized areas of S. Tomé, Guadalupe and Neves, due to their strong human presence, exhibit a considerable alteration of the natural conditions that can still be found in the most uninhabited stretch between the exit from Guadalupe and the entrance to Neves. While one (the urban) is a more domesticated zone both in terms of plants and animals the other (the rural) is the wildest and exhibits a more natural landscape.

On the other hand, while S. Tomé and Guadeloupe (capitals and districts) are characterized, with the exception of the central area of S. Tomé itself, by a rich biology that generally makes a relatively balanced combination of infrastructures, plantations and natural plants and consequently encloses a diversity of animals (small mammals, birds, reptiles, etc.) the city of Neves, which is confined to a small strip of land between the mountains and the sea is congested and shows visible problems of insalubrity, that are not very favorable to many other forms of life than the human and even for this one presents/displays clear threats and many vectors, as it is the case of rodents and a variety of insects.

Each of the three types of environments described above will require differentiated actions for road rehabilitation and coastal protection that have the potential to interfere with the balance of the receiving environment.

4.4. Socioeconomic Environment

This subchapter deals with the general socio-economic situation of STP and particularly that of the island of S. Tomé and the project area, with emphasis on the land occupation model and other factors that may have a bearing on the planning, construction and operation of the road and the coastline to be rehabilitated, including the possible need for resettlement.

São Tomé and Príncipe islands were uninhabited until 1470, when the Portuguese navigators João de Santarém and Pedro Escobar discovered them. From the 15th century until its independence on July 12, 1975 STP was a Portuguese colony.

Some of its most striking features highlight sugar cane and cacao cultivation introduced in the islands, which was associated with the importation of African slaves to the archipelago. The decline of the sugar business due to competition with Brazil is reported to have made the islands mere slave exchange points. And the economy was dominated by cocoa and its emblematic plantations that lasted until independence in 1975. These were then followed by the facts narrated in various sections of this report.

Presently, just over 95% of the population of the archipelago of S. Tomé and Príncipe lives on the island of S. Tomé, leaving only less than 5% living on Principe Island and S. Tomé being the main concentration of human activities, with all the beneficial and less beneficial consequences deriving from this.

The population density of the archipelago, i.e. above 156 inhabitants per km², is already relatively high when compared to the standards of sub-Saharan Africa and this is mainly determined by what is happening on the island of S. Tomé. At around 65% of the total population, the urban population is relatively high despite the fact that this translates into concentrations of populations in small urban areas and above all settled horizontally (there are few high buildings in S. Tomé), with the exception, perhaps, of S. Tomé which together has a little more than 71,000 inhabitants concentrated on one side in a single consolidated small urban area and on the other disposed in a relatively dispersed way and mixing several economic activities throughout the district of Água Grande. Guadalupe is more like the second area of S. Tome and Neves is a combination of small consolidated areas and many with more precarious but high-density housing. Migration from rural areas was strongly influenced by the disarticulation of the cocoa industry soon after Independence.

The whole population grows at a rate of about 1.84%, which, on the other hand, is relatively low when compared to the rest of Africa.

Increasing urbanization means, among other things, greater needs for transportation, energy pressure on natural resources. The use of fuelwood and wood for energy and housing is remarkable, which represents a significant threat to the sustainability of forests especially when, as it often seems to happen, their exploitation is not always regulated and good practices are not followed.

Access to clean water is about 90% with urban areas approaching 99%, which is also considerably high compared to sub-Saharan Africa standards. Sanitation coverage (based on improved services) is low, i.e. on average stands at 35% for the population as

a whole and at around 41% for urban areas. The remaining population uses not recommended services. The deficiencies in environmental sanitation services are also visible and sensitive in urban centers in S. Tomé in the form of concentrations of municipal solid waste that is not collected regularly and spread in disorderly spaces, open fecalism especially on the beaches that surround seaside towns and other harmful practices that translate into bad smells, proliferation of vectors, and so on.

The main industries and sectors that mobilize local labor force are agriculture, which is dominated by cocoa, coconut, coffee and vanilla, and by the industry itself, with the main occupation areas being light construction, textiles, fish processing, wood, manufacture of soaps and beverages, mainly beer. The latter is brewed in Neves, capital of the Lembá District and is the only brewery in the country.

Figure 4-12: Typical wood houses in S. Tomé (Neves)

The distribution of the active population by the main sectors of activity is as follows (i) agriculture (19%); (ii) industry (16%) and services (65%).

The level of unemployment is officially estimated at 14%, with a workforce of around 65,000 people. More than 63% of the population of São Tomé and Príncipe is between 0 and 24 years of age, which is a sign of a lot of youth and of significant growth and employment needs.

Urban and population growth tend to aggravate what can be termed a relative disordered occupation of physical spaces and may have implications for rehabilitation interventions, particularly as these relate to the possible realignment of roads and other related areas. At the outset there are many limitations to act without significantly interfering with the current land occupation pattern.

It seems that the urban centers of São Tomé were designed for small populations without concern for the projection of growth that has taken place in the last four decades.

One of the results of the above phenomenon is that the width of the roads is significantly small. This extends to the EN1 (between 5 and 7 m) and even sections of the Pantufo-São João and Aeroporto road that may be subject to the coastal protection works. Associated with what appears to be a regulatory loophole or enforcing on the minimum distances to be observed in establishing other infrastructure/economic activities along the roads, it is noted that, mainly along the EN1 and in urban areas, there are different types of infrastructure and other assets (e.g. areas of various uses and types of plants, electricity poles, lighting, telecommunications) at very short distances from the road (up to less than 2-3 meters) or even enchroachment, i.e. various objects and social activities that practically invade the road (e.g., sidewalks, stairways, etc.).

In the three urban centers of the project area, examples of the above are abundant, and these are, in Neves (km 27), but not only, situations that can be considered critical as shown in Figure 4-13 and Figure 4-14, below.

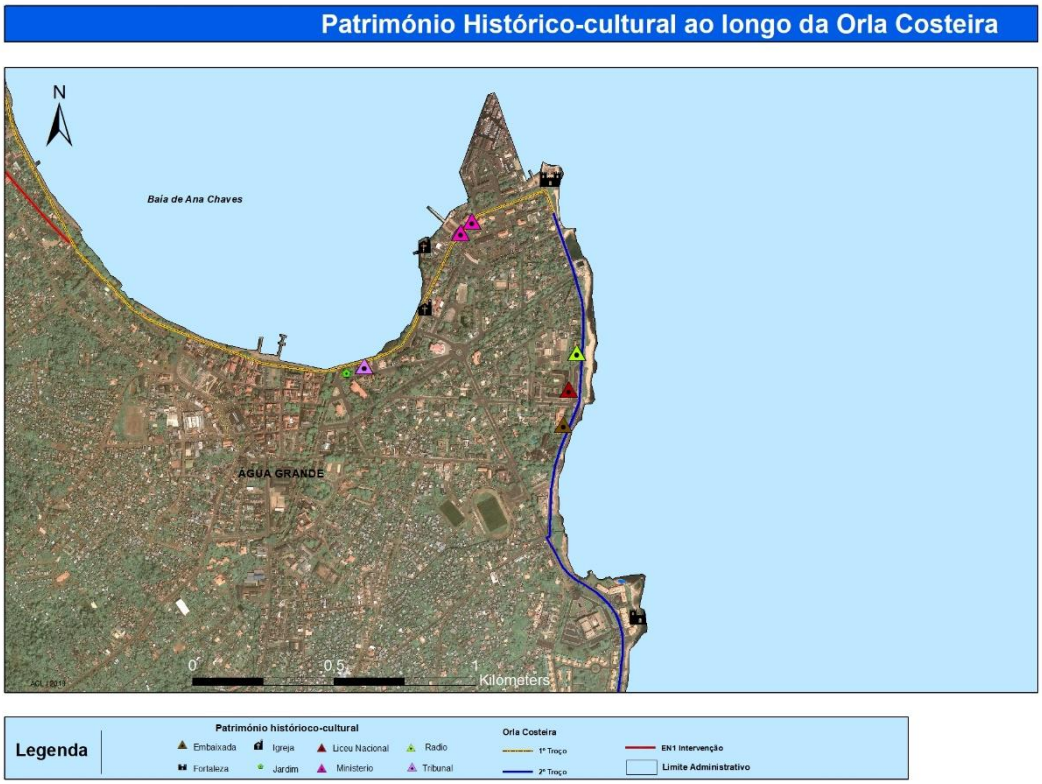
Figure 4-13: An overview of socioeconomic activities encroaching on the road Neves (km 27)

In this document and in the RPF this will be a recurring subject in the discussion and consideration of rehabilitation/design actions and the project social receiving environment, with a view to recommending ways of harmonizing interests. The settlement and land use model along EN1 is clearly a limiting factor. This tends to be aggravated, in a series of sections, by the hypsometry of the area itself.

Figure 4-14: A restaurant close to the road in S Tomé

As listed below the two infrastructure components of the project are also located in areas with a certain presence of buildings and other objects of historical-cultural value that enjoy special local status. Mainly the rehabilitation of roads associated with the coastal protection process will have to deal with this phenomenon considerably.

Figure 4-15: An overview of monuments along the two project areas



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Along the coastline of S. Tome, it was possible to make the following listing of places of historical-cultural interest, which Figure 4-15 seeks to portray.

1. **Church of the village of Pantufo/old neighborhood of Dr. Vieira Machado:** built in the fourth phase of urban development - consolidation of the city, beginning of the nineteenth and twentieth centuries, a period during which the island was considered a hostel of the Atlantic.
2. **Fortaleza de S. Jerónimo:** a simple construction, now in ruins, whose date according to the scoreboard in Roman numeration is: MDXXX. Built in the year 1613 or 1614. According to Lopes de Lima, "a fort was built - the fort of São Jerónimo - whose objective was to defend the fortress and the port connected to the city."

Figura 4-1: Vista da Fortaleza de S. Jerónimo ao longo da orla costeira da Cidade de S. Tomé

3. **Fortaleza de S. Sebastião/current National Museum:** with a quadrangular plan and four bastions, its construction begun in 1566, possibly restarted and completed in 1575, in the reign of D. Sebastião, due to the revolt of the Angolans in 1574, and due to the attacks of the French corsairs on the other Atlantic islands dominated by the Portuguese.
    a) The concern to ensure the defense of the city, was at the base of the creation of a set of fortifications.
4. **The Customs Building:** built in the second phase of urban development, the implantation of new institutional buildings, with the increase of commercial activities, with emphasis on the slave trade and the cultivation of sugar cane. This building controlled the goods and its location is only known in a cartography of 1888/89.
5. **Building of the Post and Telephone Services/current building of the Courts:** built with stones resulting from the demolition in 1913 of the Misericórdia Hospital.
6. **Church of the Cathedral/Mother Church of Nª Sª da Graça**: it was built next to the foundation of the old church of Santa Maria, by order of D. Sebastião, in the year 1576, when a new church of the Cathedral was opened and continued to work on it until the year 1578. Construction was not completed. In March of 1863, repair works began.
7. **- Republic Square/current Independence Square:** it came about during the third phase of urban development - the expansion of the city, (late 16th century beginning of the 17th century). This is a period marked by the development of maritime-commercial activities. After 1975 it was renamed Independence Square.
8. **Ana Chaves Bay:** where the city of São Tomé had its headquarter: the village was founded by Alvaro de Caminha in 1506-1510. By then it already had 250 houses of modest construction, made of wood, only one or two rooms and covered with wood. The first constructions existing in the early sixteenth century were the Tower, the churches of Santa Maria and S. Francisco, the church Mother of Our Lady da Graça, the Conceição church and the church of the Misericórdia Hospital.

9. **Bom Jesus Chapel:** built in 1770, it benefited fromrestoration works in 1936, whose extension is unknown. The tombstone inscribed on the façade of the tower refers that it was "rebuilt in MCMXXXVI".
10. Chapel of Our Lady of Belém/present Bom Despacho: it was founded around 1617. It was restored in 1965 under the works of the architect Luis Benavente.
11. **Silva Cunha Technical School/current National High School:** with a balanced expression between the traditional and the modern, evident in several other Portuguese high schools around the world in the years 1950-60: a central and elevated portico presents on each side two long wings, of rational design in two floors, with spans modulated and sequential corridors.
12. **Porto and the warehouses to store sugar**: they constituted the fundamental urban elements of the origin of the city of São Tomé. The warehouses located near the coast and near the port, in the place where later (century XIX), warehouses were installed to store cocoa and coffee. This port, besides serving to increase the commercial activities, was the access by sea and the facility to access to the sea by the beach and revolving plate of the entrance and exit of the slaves (golden period of the slave traffic). It was during the second phase of urban development of the city of São Tomé.

The famous Ocá tree (Ceiba pentandra/*Bombax pentandrum L*.) (Figure 4-16), in Conde, which, in addition to its magnificence, the locals consider that is possesses historical and cultural value. It is said that it could be more than one hundred (100) years old and is one of the most prominent references throughout EN1.

Figure 4-16: Ocá tree in Conde

As can be seen in Figure 4-16 the tree shows a considerable encroachment on the road. This and other objects of similar value should be given appropriate attention.

4.4.1. Agriculture

São Tomé agriculture, which is one of the most dynamic areas of the economy, can be summarized as follows.

After the sugar cane plantations that were associated with the importation of many slaves from different parts of the continent that marked typical early years of the colonial occupation, STP became a major producer and exporter of cocoa. Cocoa was produced in large estates dominated by private producers called “roças” who had cheap local labor at their service under the discriminatory laws of the colonial regime.

During the colonial period there were 15 agricultural enterprises that, after independence, were nationalized and transformed into state companies in the context of

a centralized and planned state economy. Over the years this new regime proved to be ineffective and unsustainable. In the wake of the adoption of the market economy in the 1990s and subsequent years, state farms were delegated to the management by the farmers who worked in these farms. This process gave rise to 3 categories of holdings: (i) large enterprises of more than 50 hectares; (ii) medium-sized enterprises, with an area between 10 and 50 hectares; and (iii) family parcels of less than 10 hectares. Very early on it was noticed that in the larger farms management problems persisted, and this gave rise to a second wave of reforms, which led to dividing and resizing some of the big companies. In this category of big companies today there are still 2 of them, , 220 Ha, and the latter was given to a Libyan company for management. At present, however, São Tomé agricultural system is dominated by the family sector, with an average of 2.5/3 hectares per plot.

The practice of agriculture follows the pattern described above, i.e. based on a combination of different crops and for different purposes (food, trade, shade, conservation in general, etc.) and on different terrains, i.e. high, medium and low and for different purposes, including shade and conservation.

Because the investments in this area have been insignificant and benefit from a regular rainfall regime combined with water conservation and other plant protection techniques, the use of water for artificial irrigation has little weight in Sao Tome agriculture.

In the context of the reform of the agrarian sector, the country's authorities have rehabilitated several drinking and irrigation water systems. These interventions were limited to the areas of family agriculture, and virtually no help was given to cocoa crops. The general policy, because of the food crisis in the country, mainly in 1983, is to reduce food imports by stimulating domestic production.

It is hoped that the development of agriculture will establish the basis for the emergence of small and medium processing industries and other related services. The GSTP in coordination with funding agencies (e.g. the African Development Bank (AfDB)) has been exploring ways to lend greater dynamism to this sector through measures such as productivity enhancement, institutional strengthening and capacity building, monitoring and evaluation of projects. Among other aspects, this involves the rehabilitation of roads, with emphasis on EN1, which is the focus of this document.

4.4.2. Important Socioeconomic Environment Traits in the Project Area

The most striking socioeconomic trait in the project area is the one that stands out from the descriptions made above and it is related to the land occupation model. It translates into limitations for measures that may require more space for possible realignments of the roads.

The limitations practically tend to make most of the Scenario 0, i.e. without any kind of intervention (regular maintenance), as being the most feasible or the only one possible. This Scenario would be attractive if EN1 was to be reserved for other types of developments and uses as could be for example tourism. In this sense, it would serve as a facilitator for access to picturesque and typical areas of S. Tomé but would be of little use and marked by low load capacity, limitations of vehicle volume, speed of movement and other limitations. Providing support to national traffic for most economic activities, opting for current maintenance (Scenario 0) raises many problems and clearly delays the development of a road or roads that are already necessary and will continue to be increasingly necessary as the population grows accompanied by other forms of economic and social development.

The issues raised above go beyond the scope of this project and its environmental and social safeguards and can only be referred to the highest levels of governance including the Road Master Plan that the country already feels is necessary. It will be up to this plan to equate in time and in space how to get out of the existing dilemma.

This ESMF and the associated RPF will attempt to optimize any of the Scenarios currently under consideration or any combinations of these three Scenarios. What is undeniable is that, given the problems that exist, practically any intervention will be better than doing nothing. On the other hand, it is possible to develop the various components of the project without causing major impacts and without extending to larger areas that go beyond the nearest places.

On the other hand, due to its history dating back to the fifteenth century, with the arrival of the first Portuguese navigators, the occupation that followed, the arrival of slaves and other inhabitants to the archipelago for the sugar and cacao businesses, the use of the archipelago as a trading center for slaves from the sixteenth century onwards, cocoa plantations, etc. the City of S. Tomé and its surrounding areas exhibit a considerable heritage wealth from the historical-cultural point of view, which, in its own way, documents these developments. This can be seen in monuments and other buildings in several points, but especially on the coastline of the capital city.

The planned coastal protection actions will have to be in line with the good practices recommended by the GSTP and the BM in dealing with this type of heritage.

5. LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter deals with the legal and institutional framework upon which the project will be developed to conform to the principles of sound management of the natural socioeconomic receiving environment. The chapter reviews the policies and safeguards of the World Bank and the GSTP, assesses the extent to which the two sets of policies can be combined to achieve the desired objectives, identifies any discrepancies that may exist and recommends the best ways to overcome such discrepancies and achieve an ideal combination of all factors.

5.1. World Bank Policies and Safeguards

Building on its experience of more than six decades of support to development, the WB has established and has been implementing a range of environmental and social safeguard policy instruments that are applied to projects in which it operates around the world. The following paragraphs highlight the most relevant aspects for this project.

5.1.1. Triggered Policies, Meaning and Framework

Because of its focus on road engineering works and coastal protection infrastructures, and due to the low magnitude, extent and intensity of planned activities, the project it will finally only trigger four (04) of the 10 + 2 Operational Policies of the World Bank Safeguards, namely the Environmental Assessment (OP/BP 04.01), Natural Habitats (OP/BP 04.04), Physical Cultural Resources (OP/BP 4.11) and Involuntary Resettlement (OP/BP 4.12). In the following paragraphs these safeguards policies are briefly analyzed and evaluated from the point of view of their applicability to the project.

Table 5-1: Safeguard Policies Triggered by the Project

Triggered Safeguard Policies	YES	No
Environmental Assessment (OP/BP 01.04)	X	
Natural Habitats (OP/BP 04.04)	X	
Forests (OP/BP 4:36)		X
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP/BP 4.11)	X	X
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)	X	
Safety of Dams (OP/BP 4.37)		X
Projects in International Waters (OP/BP 7.50)		X
Projects in Controversial Areas (OP/BP 7.60)		X

In Table 5-2, below, these Safeguards Policies are briefly analyzed and evaluated from the point of view of applicability to the project

Table 5-2: The Ten World Bank Operational Environmental and Social Policy Safeguards

Safeguard Policies	Main goal	Applicability	Applicability in Relation to TCP Project
Environmental Assessment (OP/BP 01.04)	Used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. This policy is the umbrella policy for the Bank's environmental safeguard policies.	The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people are properly consulted.	**Applicable**. Because the project will have to obtain an environmental license from the Sao Tome authorities to an extent that is also acceptable to the Bank to qualify for funding and to progress to subsequent phases
Natural Habitats (OP/BP 04.04)	Aimed at ensuring that World Bank-supported infrastructure and other development projects consider the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes natural habitats which are either: (i) legally protected; (ii) officially proposed for protection; or (iii) unprotected but of known high conservation value. In other (non-critical) natural habitats, Bank supported projects can cause significant loss or degradation only when (i) there are no feasible alternatives to achieve the project's substantial overall net benefits; and (ii) acceptable mitigation measures, such as compensatory protected areas, are included within the project.	It strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present).	**Applicable**. Especially because of the coastal protection component and the fact that the whole project is practically develops in the coastal area recognized as encompassing sensitive natural habitats that need to be preserved. Within the scope of this ESMF provisions have been specified to ensure that the feasibility studies of the project and its final design optimize the contribution that the project should offer to the proper management of natural resources and particularly marine and coastal resources.

Safeguard Policies	Main goal	Applicability	Applicability in Relation to TCP Project
Forests (OP/BP 4:36)	Aimed at reducing deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. The policy is currently being revised to make it more effective and in recognition of the fact that forests play an increasingly important role in poverty alleviation, economic development, and for providing local as well as global environmental services.	Reduction of deforestation and use of forests to promote economic development	**Not applicable**. Although the project will be developed in an area that has intersections with forest areas, it will not interfere with the factors that inform the quality of forests resources. It is not a project directly related to logging or to encourage the use of forests resources. Under this ESMF provisions were specified to ensure that the project feasibility studies and the final design of the project should optimize the contribution that the project can provide for the proper management of forest resources of the project area and the surrounding area.
Pest Management (OP 4.09)	Aimed at assisting rural development and health sector projects to avoid using harmful pesticides and encourage the use of Integrated Pest Management (IPM) techniques in the whole of the sectors concerned.	Where pesticides must be used in crop protection or in the fight against vector-borne diseases, the Bank-funded project should include a Pest Management Plan (PMP), prepared by the borrower, either as a stand-alone document or as part of an Environmental Assessment.	**Not applicable**. The project will not use pesticides or have direct relationships with the eventual development of such use
Physical Cultural Resources (OP/BP 4.11)	The objective of this policy is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances. The assumption is that cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's	The borrower identifies physical cultural resources likely to be affected by the project and assesses the project's potential impacts on these resources as an integral part of the EA process, in accordance with the Bank's EA requirements	**Applicable**. Particularly because the coastal and marine area of S. Tomé and the districts and cities of the project are recognized as encompassing cultural resources dating back to the 15th century and must be preserved. This recognition of cultural value may only be local and does not extend to international institutions such as UNESCO and

Safeguard Policies	Main goal	Applicability	Applicability in Relation to TCP Project
	cultural identity and practices. The loss of such resources is irreversible, but fortunately, it is often avoidable.		related institutions. Although the policy may not be formally applicable the need to ensure that all precautions are taken to protect the physical cultural resources where they exist and are known, and if they are found in the project area, they are an intrinsic part of this ESMF. This includes measures to deal with potential negative impacts on cultural heritage and it is recommended that at the stage of the environmental impact studies the team leading the studies will integrate one or more experts to make a more elaborate determination on the potential that sites might have to house valuables that could justify more restrictive measures. This ESMF makes an initial inventory of these resources.
Indigenous Peoples (OP/BP 4.10)	The policy underscores the need for Borrowers and Bank staff to identify indigenous peoples, consult with them, ensure that they participate in, and benefit from Bank-funded operations in a culturally appropriate way - and that adverse impacts on them are avoided, or where not feasible, minimized or mitigated.	Integration of indigenous peoples in project development and benefits	Not applicable. STP is not known for having indigenous peoples. When the islands were discovered in the fifteenth century the islands had no inhabitants. All its inhabitants had to be brought in and/or come from other parts of Africa and the world.
Involuntary Resettlement (OP/BP 4.12)	The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It is also aimed at promoting the	The policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas.	**Applicable**. Even if from the outset it is recognized that there is an opportunity to considerably avoid expropriations to open space for rehabilitation/coastal protection

Safeguard Policies	Main goal	Applicability	Applicability in Relation to TCP Project
	participation of displaced people in resettlement planning and implementation. Its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects		actions, due to outdated and relatively disorderly settlements in and around the infrastructures to be rehabilitated the risk of small disturbances on assets, people's livelihoods and their communities appear to be on the cards, even if these are to be on a temporary basis. Whenever the project triggers expropriation or restriction of access to resources that are part of the daily life of people, communities and other public and private entities, the provisions of this policy will have to be adhered to consistently and systematically.
Safety of Dams (OP/BP 4.37)	Aimed at ensuring that experienced and competent professionals design and supervise construction of bank-funded dams, and that the borrower adopts and implements dam safety measures throughout the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.	Ensure that all precautionary measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs are in place where there are bank-funded dams.	**Not applicable**. The project does not include the construction and operation of dams.
Projects in International Rivers Waterways (OP/BP 7.50)	Aimed at assisting riparian stated to make appropriate agreements or arrangements for the entire waterway, or parts thereof, where bank-funded projects involve	Where the project area stretches over water ways that cover more than one state	**Not applicable**. STP does not share border with any other state. All the rivers are confined to the country's territory and as seen under Chapter 4, these are of small extension

Safeguard Policies	Main goal	Applicability	Applicability in Relation to TCP Project
	international rivers. It requires that adequate detailed procedures for inter-state notification be followed by riparian states		
Projects controversial/disputes areas (OP/BP 7.60)	Aimed at ensuring that the Bank only finances projects in disputed areas when either there is no objection from the other claimant to the disputed area, or when the special circumstances of the case support Bank financing, notwithstanding the objection. The policy details those special circumstances.	Where there are disputed areas the Bank wants to make sure that it is not making any judgment on the legal or other status of the territories concerned or to prejudice the final determination of the parties' claims.	**Not applicable**. There are no land disputes in STP and much less in the project area

Further details about the policies described above, and especially those that apply to the project, are given in the following subchapters.

5.1.1.1. Environmental Assessment (OP/BP 01.04)

This World Bank's environmental assessment operational policy requires that all proposed Bank-funded projects, no matter the source of funding be screened for potential environmental and social impacts. The policy is triggered if a project is likely to have adverse environmental and social risks and impacts in its area of influence. Similarly, each proposed subproject activity is required to undergo the same social and environmental screening process to qualify for funding. This is done through the systematic usage of both the Environmental and Social Screening Form (ESSF) and the Check-list. Moreover, according to OP/BP 4.01 the Bank classifies proposed projects into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of their potential environmental and social impacts:

Category A: A proposed project is classified under Category "**A**" if it is likely to have significant adverse environmental and social impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. Environmental and Social Impact Assessment (ESIA) for a Category A project examines the project's potential negative and positive environmental and social impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental and social performance. For a Category A project, the borrower is responsible for preparing safeguards documents, normally either an Environmental and Social Management Framework (ESMF) when the physical footprint of a project is unknown by appraisal, or an Environmental and Social Impact Assessment (ESIA with an Environmental and Social Management Plan [ESMP]), or an Environmental Audit/Risk Assessment whenever the physical footprint of a project activity is known prior/by appraisal stage.

Category B: A proposed project is classified as Category "B" if its potential adverse environmental and social impacts on human populations or environmentally and socially important areas, including wetlands; forests, grasslands, and other natural habitats, are less adverse than those of Category "A" projects. These impacts are site-specific and easier to deal with; few if any of them are irreversible; and in most cases appropriate mitigation measures can be readily designed. The scope of ESIA for a category "B" project may vary from project to project, but it is narrower than that of a category "A" ESIA. Like Category A ESIAs, it examines the project's potential negative and positive environmental and social impacts and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts while improving the project environmental and social performance. For simple Category B projects with very limited/low social and environmental impacts the preparation of Environmental and Social Management Plan (ESMP) that builds upon an ESMF might be sufficient. By the same token, the preparation of an abbreviated RAP that builds upon a RPF might suffice. Resettlement issues will be further elaborated under OP/BP 4.12, below, and the RPF for this project, which is presented separately.

Category C: A proposed project is classified as Category "C" if it is likely to have minimal or no adverse environmental and social impacts. Beyond screening, no further ESMF/ESIA or ESMP or RPF/RAP action is required for a Category "C" project. Nonetheless, being a category C project doesn't necessarily prevent a project from ensuring adequate monitoring of both environmental and social aspects of projects that are beyond safeguards.

Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in projects that may result in adverse environmental and social impacts."

Mainly because of its limited environmental and social impacts the project has now been classified as a Category “B” project; and since the final design of the project and its sub-components and final schedule have not yet been clearly defined, the World Bank required the preparation of an ESMF, which is a preliminary assessment tool for projects for potential environmental and social impacts. It has been already defined that based on the result of the environmental and social review to be done by the environmental, social, health and safety experts, which are already working on specific areas of the project, project interventions will have to prepare a simple ESIA/ESMP to identify and assess project impacts on the receiving natural and social environment and prepare the management plan. The costs for the preparation of the ESIA/ESMP should be included in the project budget. The result of the selection and determination of the category of the project and its components will have to be confirmed and approved by the environmental authorities of Sao Tome and Principe (Ministry of Infrastructure, Natural Resources and Environment (MRNEA)) to verify compliance with the São Tomé and Principe’s EIA Policy. Although the World Bank's policies and procedures are to be followed, the terms of reference for the ESIA also need to be approved by both S Tome and Principe authorities and the World Bank.

The project also needs to comply with the Environmental, Health and Safety Guidelines (EHS) of the World Bank, of April 2007, comprising a multiplicity of technical reference guidelines with specific examples of Good International Industrial Practices (GIIP) that must be followed in the development and implementation of projects financed by the Bank. These guidelines cover a range of areas and in relation to this project are presented as having interests those relating to (i) **Environment** (air emissions and environmental air quality, waste water and environmental water quality; water conservation, management of hazardous materials, waste management, noise, and contaminated sites); (ii) **Occupational Health and Safety** (general design and operation of the project, communication and training, physical hazards, chemical hazards, biological hazards, radiological hazards, personal protective equipment, special hazard environments, and monitoring); (iii) **Community Health and Safety** (structural safety of the project infrastructure, life and fire safety, traffic safety, transportation of hazardous materials, disease prevention, emergency preparedness and response); (iv) **Noise** (selection of equipment with lower sound power levels, installation of silencers for fans, installation of adequate silencers in the exhaust of motors and compressor components, installation of acoustic insulation for coating equipment that radiate noise, etc.).

hazardous materials, disease prevention, and preparedness and emergency response) ;

and (iv) the more specific guidelines in this case on **Power Transmission and Distribution**. The elements of these provisions will be best described throughout this document and their practical implementation included in the annexes.

About **road construction/rehabilitation** there are several precautions to be taken in relation to habitat change and fragmentation, storm water management, waste, noise, atmospheric emissions, wastewater. This also includes details on (i) avoiding or modifying construction activities during the mating season of animals and other sensitive stations or times of day to consider potentially negative effects; (ii) to prevent short- and long-term impacts on the quality of aquatic habitats, minimize deforestation and destruction of riparian and marine vegetation and fauna; provide adequate protection

against wear and erosion; and to consider the beginning of the rainy season in relation to construction schedules; (iii) minimization of the removal of native plant species and replanting of native plant species in disturbed areas; (iv) explore opportunities for habitat improvement through practices such as placing nesting boxes of animals and especially birds in bondage, boxes for bats under bridges and reduced cutting to conserve or restore native species; (v) management of campground activities as described in the relevant sections of the EHS Guidelines.

The elements of the above-mentioned provisions will be better described throughout this document and their practical operationalization included in annexes.

5.1.1.2. Natural Habitats (OP/BP 04.04)

This policy applies to projects, which could have a potential impact on important natural habitats outside and inside protected areas. Significant conversion of natural habitat is allowed under this policy if there are no viable alternatives, but the affected natural habitat needs to be compensated by an ecologically similar area of the same or larger size and the area needs to be better managed and protected. Projects involving the significant **conversion** of critical natural habitats, i.e. protected areas or critical natural habitat areas outside protected areas where endemic or endangered species mentioned on the IUCN Red List species are living and which could be severely affected or made extinct cannot be financed.

Above all, because the project has strong relationships with the marine and coastal area, the ESMF presents a series of provisions to ensure that adequate measures are taken to minimize the negative impacts that may occur. Nevertheless, the project does not foresee any conversion of natural habitats.

5.1.1.3. Physical Cultural Resources (OP/BP 4.11)

This policy applies to projects where important physical cultural resources (i.e. archeological sites, special architecture, important cemeteries or where unique immaterial cultural resources) exist or are affected. In case none of these physical cultural resources exist in a project area, the bidding documents and the contractor contracts need to include a “Chance Find Procedure”, which specifies that in case that during construction an important artefact is found, construction is stopped, and the responsible GSTP authorities are warned and involved in an investigation of the site. Construction can only resume after the green light has been given by the responsible GSTP authorities. The ESMF has made some provisions to ensure that adequate measures are considered to minimize the negative impacts that may occur.

This project does not foresee to interfere with any known cultural-physical resources but since some of the project areas are recognized as containing part of such resources, even if these are not recognized internationally, the ESMF highlights these provisions to ensure that adequate measures are taken to minimize the negative impacts that may occur.

First it is expressly indicated that project interventions should distance themselves from such resources or that should not act on them without the approval of the competent authorities and on the other and as a precautionary measure the “Chance Find Procedure” should be included in all notices and contractors' contracts, especially during construction.

During the phase of the more detailed environmental and social impact studies, the inclusion of an archeology/history specialist should be included to more accurately determine the potential of the sites where the project will focus to accommodate objects of historical and cultural value.

5.1.1.4. Involuntary Resettlement (OP/BP 4.12)

Under the World Bank Safeguard Policy (OP/BP 4.12 - "Involuntary Resettlement") resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs. Where it is not feasible to avoid resettlement, related activities should be conceived and executed as sustainable development programs, providing sufficient investment resources and means to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in the planning and implementation of resettlement programs.

Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

> The World Bank also adopts a broader view on involuntary resettlement by not restricting it to its usual meaning, i.e. "physical displacement". Depending on the cases, a resettlement action may include (i) loss of land or physical structures on the land, including business; (ii) the physical movement, and (iii) the economic rehabilitation of project affected persons (PAPs), economic displacement, to improve (or at least restore) the levels of income or livelihood prevailing before the action causing the resettlement has taken place". The policy applies whether or not the person has to move from the area

Box 1: WB Vision on resettlement

As described in Chapter 4 of this document on the natural and social receiving environment, the land use and occupation model in the project area, with respect to the rehabilitation of a significant parts of the sections of the roads, is such that the project has potential of interfering with the ways of living and assets of people and other entities. Under this ESMF and the associated RPF this should be avoided at all costs or minimized where it is not possible to avoid. If there is an entity that will have to undergo expropriations of any kind, even if minimal, information and hearing actions should be taken to ensure that people understand the reasons for having such an effect and that they could provide prior, free and informed consent about the options that are presented to compensate for the potential losses. People should have the opportunity to participate in all the process of restoring losses and be properly compensated before the start of project implementation.

5.2. Legal and Institutional Framework for Environmental and Social Management in S. Tomé & Príncipe

As with most countries in many parts of the world, following the Rio Conference on Sustainable Development, in 1992; São Tomé and Príncipe initiated a reform process under which significant wide-ranging set of policies, laws and regulations have also been approved and activated to turn STP into a cleaner country and to promote the sustainable user of natural and social resources. The reform has been taking place and being implemented in the form of: (a) adherence to and adoption of a series of international and regional conventions and protocols on environmental protection and conservation; (b) approval of a significant set of legislation with direct and indirect implications on

environmental protection; (c) establishment of specific public institutions or strengthening of existing institutions dedicated to environmental and social management.

5.2.1. Legal Framework

5.2.1.1. Adherence to International and Regional Protocols and Conventions

STP is signatory of a series of international and regional protocols and conventions relating to the use and sustainable management of environmental aspects. Following the adherence to these instruments the authorities have been developing policies, strategies and plans to meet the requirements of the country's adherence and to add value to national development. Of importance for this ESMF the following should be mentioned:

The UN Convention on Biodiversity

By ratifying this Convention, the GSTP recognizes that biological resources are a source of potential income that can bring significant benefits to people, if the resources are managed sustainably. Recent advances in biotechnology highlights the immense potential of the genetic material contained in plants, animals and microorganisms acquired for agriculture, health, social welfare and environment, which is critical.

Despite the efforts that have been made by the national authorities and the international community for the protection of biodiversity, degradation and the loss of many species continues to affect both Sao Tome and Principe and the world in general.

The document on "The National Plan of Action and Strategy for Biodiversity Conservation" is a step forward to reach out to the future of the environment in general and particularly biodiversity of Sao Tome and Principe.

The strategy and the actions proposed by this National Plan of Action in four defined ecosystems for the country, including the Coastal and Marine Ecosystem, Inland Waters Ecosystems, Forest and Agricultural Ecosystems contains measures to be implemented in the short, medium and long term, at national level, with the support of the international community. It is mainly based on in *sitio* and ex. *site* protection conservation of biological and genetic resources, which will contribute to improving the quality of Biological Diversity in Sao Tome and Principe, to improve management and fair and equitable sharing of benefits that can provide additional distribution.

Stockholm Convention on Persistent Organic Pollutants (POPs)

The ratification of this Convention by the GSTP is because it recognizes that over the years, environmental pollution in general and the pollution caused using chemicals on the natural environment, have reached alarming proportions with disastrous consequences for the future socioeconomic development.

Persistent Organic Pollutants, with the main emphasis on PCBs, Dioxins and Furaneols and POPs Pesticides, have occupied an important place in chemical pollution with serious consequences for the health of the population and to the atmosphere.

The Democratic Republic of Sao Tome and Principe as well as many other countries around the world also used POPs Pesticides in the fight against the disease-causing vectors, with focus on the mosquitoes that transmit malaria.

Aware of the damage that these products cause to the environment, national authorities have decided to join their efforts with the international community, to give proper destiny to those pollutants, to minimize the negative effects on nature.

After the signing, on April 3, 2002, of the Stockholm Convention on Persistent Organic Pollutants, Sao Tome and Principe started the implementation of Article 7 of the Convention, which was to prepare the Strategy and Action Plan for the sustainable management of those products in the country.

With the development of the Strategy and Action Plan on POPs, STP is aware that the international community will help Sao Tome and Principe to implement the priority actions defined in the Plan, which will lead to the sustainable management of chemical products in the country and contribute to a healthier environment.

Convention of the United Nations Framework Convention on Climate Change

On the 30th of May 1998 Sao Tome and Principe joined and ratified the United Nations Framework Convention on Climate Change, thus becoming a full member of the Conference of Parties (COP). Consequently, implicitly, the country committed to periodically develop, update, publish and make available to the Conference of Parties the national anthropogenic emissions by sources and removals by sinks of all the greenhouse gases inventories not controlled by the Montreal Protocol, as well to provide an overview of measures that lead to climate change mitigation and propose measures to facilitate adequate adaptation to this phenomenon.

About climate change it is also of note that STP participated and recently ratified the principle agreements on this phenomenon (November/December 2015) in Paris, COP 21.

The climate change subject is of interest to the project into consideration in this document in so far as it seeks to counteract some of the effects of this phenomenon, those relating to sea level rise and the coastal zone degradation.

5.2.1.2. Domestic Policies and Legal Instruments

The country has also been approving and enacting a wide range of policies, laws and regulations to make STPs a cleaner and more sustainable user of their natural and social resources. For the purposes of this ESMF, the following are highlighted:

General Legislation

The Constitution

The Constitution is the supreme law of Sao Tome and Principe. The sections of the Constitution that more importance have for the environmental and social management include but are not limited to:

- Article 47 - Private property. Article 47 guarantees to all the country's citizens the right to own private property and to transfer it in life and after death; the acquisition and expropriation of that property for public purposes may only be made based on the law.
- The Civil Code, in its Article 1308, also specifies that no one may be deprived of their right to property, in whole or in part, except as defined by law. Where there

is the expropriation in the public interest, an adequate compensation to the owner (s) must be paid.

- Article 49 - Housing and environment.
- Article 49 provides that everyone has the right to housing and a human environment and ensures that all the citizens have the right and duty to defend these rights.
- In the spirit of the Constitution, all environmental laws allow citizens to have access to natural resources and use them for economic and social development, contributing to the acquisition of financial means directed to the fight against poverty, biodiversity conservation and protection of biological resources.
- Article 43 – Workers rights. Article 43 guarantees all workers the right to fair remuneration and work in a healthy and safe environment.

Environmental legislation

There is a set (that is continually growing) of laws that deal with the environment, most of which concern the National Parks or specifically the forests, waste and pollution management or stocks of several species of the biophysical environment. The following regulations are considered relevant:

Framework Law on the Environment (Law no. 10/99)

This law defines the basis of the national policy on environment, which provides an overview of the various mechanisms and tools for sustainable development, such as the preliminary impact assessment, limits of polluting activities, strategic plans for development and/or protection of important natural resources in economic or conservation terms, etc.

The environment is defined as consisting of physical elements, chemical, biological and the relationships between them as well as the economic, social and cultural rights that directly or indirectly affect the quality of human life.

Article 7 of that law defines the principle of participation, whereby citizens and various social groups should be involved and participate in decision-making, while the Article 8 guarantees everyone the right of access to adequate information on the environment.

Paragraph 4 of Article 8 requires the State to facilitate and encourage public awareness and participation by providing the required information.

Paragraph 1 of Article 45 states that the **plans, projects, activities and actions that have an impact on the environment in the territory, or on the quality of life of the people must meet environmental standards and go together with an environmental impact study**. This is of importance for the intended road rehabilitation and coastal protection and is valid for the same regardless of the scenarios to be adopted: if impacts are expected an assessment should be made, i.e. at least the preliminary assessment for the state representative in environmental management to have a basis for deciding on the next steps that can be (i) exempt the Developer from preparing an EIA; or (ii) require the Developer to prepare an EIA and respective EMP.

Article 45 also provides details about the contents of an environmental impact study and requires the approval of the environmental impact assessment by the Ministry of the Environment as a prerequisite to authorize construction. The practical aspects related to this legal provision are best developed in the Regulation on the process of the environmental impact assessment (Decree-Law no. 37/99), best dealt with below, which

will guide the environmental licensing of the project under consideration in this document, as regards compliance with the Sao Tome requirements.

Regulation on the process of environmental impact assessment (Decree-Law no. 37/99)

This decree defines the rules and principles on environmental impact assessment.

In short, it requires that all activities that due to their nature, size or location, can cause significant impacts on the environment, must submit an environmental impact assessment prior to their implementation. Unlike the Guidelines of the World Bank on the environmental impact assessment regulation Sao Tome does not categorize the different projects except to indicate if they need or not to conduct a study, in line with a determination to be made by the authorities based on the submission of basic information and preliminary environmental assessment by the project Developers. The environmental and social management plans or the need to develop them within the ESIA, although they can be inferred from the Regulation, are also not mentioned specifically.

The Regulation provides for a pre-assessment mechanism under which the applicant presents a description of the project to the government authority, after which the level of assessment that is required is defined. The terms of reference and the intention to carry out the assessment are then made public.

Depending on the size and scale of the proposed development, the government authority may grant an exemption to conduct additional environmental and social impact studies or require them to be carried out. The regulations set out the requirements and content of impact assessment reports.

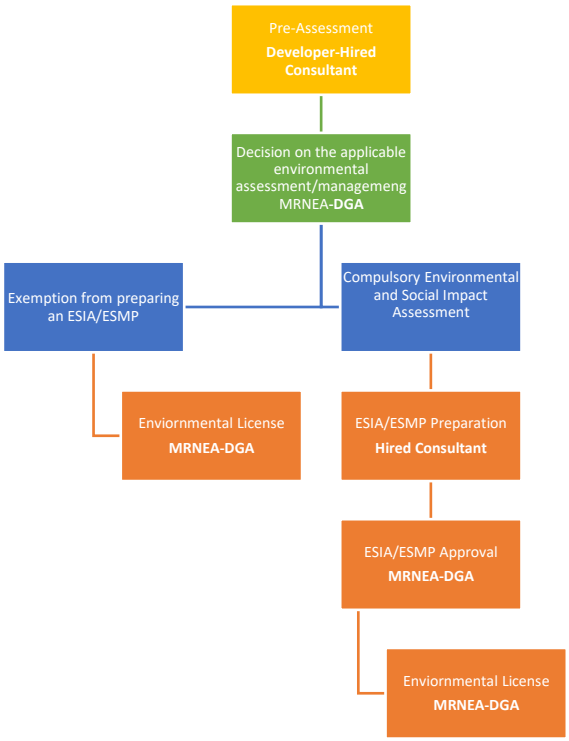
After the assessment completion, it is presented to the government authority to review and, after its acceptance, an environmental license is issued. The other licenses related to the proposed development can only be issued after obtaining the environmental license.

The public consultation process is outlined in detail, requiring the involvement of stakeholders and describing the process to be followed, as well as the concerns raised, and the answers given.

The government authority should perform, on a regular basis, inspection and supervision of the monitoring activities carried out by the Developer to ensure that environmental issues are considered.

The Figure below outlines the flow of actions and responsibilities in conducting environmental and social licensing processes.

Figure 5-1: Environmental licensing process in STP



Article 15 of the Regulation requires that environmental consultants be registered in Sao Tome and Principe before they can prepare environmental impact studies.

Annex 1 of the Regulation lists the types of activities for which impact assessments are necessary, or at least the pre-assessment reports. For the purposes of the Road Rehabilitation and Coastal Protection Project in consideration in this document are of importance references to the following interventions that should present a preliminary assessment for the purpose of determining the type of environmental impact assessment and/or environmental licensing required:

- Clearing, dividing into plots the utilization of native vegetation with individual or cumulative areas, over 7 hectares;
- Use of water resources and waterworks of large size, such as …., diversion of waterways, drainage systems, …., opening slabs, mouthpieces, or dykes;
- Programs or projects that can directly or indirectly affect sensitive areas such as;
    - coral reefs;
    - mangroves;
    - native forests;
    - areas of eminent erosion (slopes of mountains, seaside dunes)
    - areas exposed to desertification;
    - conservation or protection areas;
    - marshes;
    - areas of endangered habitats and ecosystems;
    - unique setting areas;
    - areas of archaeological, historical or cultural preservation;
    - areas where there are estates, plants or endangered animals.

The regulation is not clear about the dichotomy between rehabilitation/new development but as outlined by the Framework Law (Law no. 10/99) the important thing is whether in

relation to the proposed development impacts can be expected or not. In any event the preliminary assessment - in the case of the Transport and Coastal Protection Project (TCP) – there are reasons to believe that it is unavoidable. In the exchanges between the project Developers, i.e. AFAP, INAE and the General Directorate of Environment (DGA), the need for an ESIA for TCP was confirmed. The TOR were prepared by AFAP in coordination with the INAE and a Consultant who is carrying out the ESIA has already been identified and recruited. The ESIA will have to follow the provisions of this ESMF and accompanying RPF that together summarize the WB and GSTP provisions regarding the environmental and social management matters that are of interest to the project.

The regulation also specifies that until specific national standards are adopted, the standards set by international organizations or international conventions ratified by Sao Tome Principe, shall be adopted ((point (n) of Chapter 1 (General Definitions), Article 1 (definitions)).

Law of Conservation of Fauna, Flora and Protected Areas (Law no. 11/99)

This law governs the conservation of fauna and flora, the creation of protected areas, it establishes lists of protected species and defines the country areas geared to the conservation of habitats and biodiversity. In Chapter 4 of this document endemic species listed on the IUCN Red List that should be taken into consideration in subsequent stages of completion, project implementation and operation were presented.

Land Management Law

The Law of State Land Management and Ownership (Law no. 3/91) defines the framework of issues related to land belonging to the State. It deals with land property, identifying State public and private property, and sets the basis for private rental and the use of state land, particularly in the distribution for investment purposes.

Among other aspects, the law specifies that “Land occupied by roads or public roads, as well as those occupied by airports, airfields of public interest, belong to the state domain” (point e), Chapter I, Section I, Article 1 of the Public Domain). The land corresponding to the beds of rivers and maritime waters (point (a) of the same Chapter and Section) also falls within the same category.

In a sense, Law No. 3/91 is one of the attempts to correct land problems in STP that resulted from the processes initiated in the post-independence period, which were strongly marked by agricultural “nationalization”. This is a process that led to the nationalization and distribution of land to the population. This step continues to be seen by many as being at the root of most of the problems in the land sector that Sao Tome and Principe still faces today.

Nationalizations converted more than 90 percent of land that had formerly belonged to colonial occupiers into state owned land and soon later into large state-run agricultural enterprises, with a share of parcels being held privately in the hands of national citizens who have received them by inheritance in the family. The privatization process that took place in 1990s, after recognizing the failure of state-owned enterprises, was marked by problems, which Law 3/91 attempts to correct.

Even under Law N.° 3/91, ultimately, in STP, all lands whose owners are not private entities belong to the state, under the public or private domain. The law also specifies that land reserves are created or established by government decree (Article 11). Under

this law STP does not formally have a land market. Citizens and other national or foreign entities acquire rights to the land (land use rights). Private land ownership is provided for "*glebas* (fiefs)" and "rustic or urban lands which have not been subject to nationalization", mentioned above. But it is noted that both the technical aspects (demarcations) and those that define the processes to be followed to create reserves, acquire use rights, concessions, exchanges, etc. provided for by law, have not been following a linear path. This establishes an environment of relative deregulation in the land sphere. For example. concrete aspects of road right-of-way are marked by the omission of definitions (distances to be considered as exclusively reserved for the interests of running and developing roads) and irregular adaptations at the field level (there is relative chaos in the settlement model along the roads).

Chapter 4 of this document outlined the land occupation regime in the country in general and in the project area and this should be considered in the subsequent phases of finalization, implementation and operation of the project. The fact is that the STP Constitution guarantees to all citizens the right to private property, housing and the environment as well as the duty to defend these rights (Articles 47 and 49).

Involuntary resettlement

Sao Tome and Principe does not have a specific legal provision regulating resettlement issues as they are defined by the Bank, i.e. "(i) the loss of land or physical structures on the land, including businesses; (ii) physical movement, and (iii) the economic rehabilitation of those affected by the project (PAPs), economic displacement, in order to improve (or at least restore) income levels or existing livelihood before the action causing resettlement has taken place". Some of the aspects are included in the Law of State Land Management and Ownership (Law no. 3/91), which is blank in many aspects.

In addition, the country has a history without relevant records related with resettlement actions. The developments that have occurred in the country so far are perceived as not having triggered the need for a specific law on this matter which may be the result of a mix between perceptions and local realities, which in fact may not yet have been very demanding on this field.

Resettlement issues that are likely to arise will have to deal with these facts and ensure that ultimately Bank regulations prevail.

5.2.2. Institutional Framework

Dating back from the 1990s the GSTP has had within its institutional governance framework a central entity (ministry) responsible for environmental issues, which is a further demonstration of the high profile that this development sector is given. Over the years different governments have made combinations of this sector with others that have influenced the names and possibly other small domestic issues. Under the current government the environmental sector has been integrated in the Ministry of Infrastructure, Natural Resources and Environment (MRNEA).

MRNEA and/or its predecessors have been deepening their approach to dealing with environmental management, adopting strategies and medium to long-term policies and respective laws and regulations.

The main areas of intervention include the formulation of policies, general promotion, planning, research/technology, investment in infrastructure and other relevant areas, regulation, inspection, creation of extension/education/awareness, etc. The

understanding of the environment as a crosscutting subject coordinated by MRNEA has led to the definition of environmental line ministries to integrate other ministries/sectors that deal directly with the major environmental components, i.e., soil and subsoil, water, air and biotic components (flora and fauna). For ease of analysis, in general, these components may also be subdivided into two broad categories:

(i) Those that depend directly on natural resources as their main source of raw materials (inputs) include:

- **Agriculture** (land and forest) - which currently are under the direct responsibility of the Ministry of Agriculture and Rural Development
- **Fisheries** (fisheries) - also under the responsibility of the Ministry of Agriculture and Rural Development
- **Mining** (mineral resources) - under the Ministry of Infrastructure, Natural Resources and Environment, although it is a fact that STP hardly has a significant mining activity, except for oil exploration mentioned in the beginning of this document and the extraction of aggregates for construction
- **Public Works** (infrastructure) and housing (water and soil) - essentially the responsibility of the Ministry of Infrastructure, Natural Resources and Environment and local governments

(ii) Those components whose results depend largely on the provision of environmental services include:

- **Energy** (water, mineral resources, biotic elements for biofuels, etc.) – under the responsibility of the Ministries of Infrastructure, Natural Resources and Environment/Agriculture and Rural Development
- **Tourism** (landscape and wildlife) - under the responsibility of the Ministries of Infrastructure, Natural Resources and Environment/Economy and International Cooperation/Agriculture and Rural Development (Parks)
- **Health** (water and infrastructure) - under the Ministry of Health

Currently, the list of environmental ministries includes, but is not limited to:

- **Agriculture:** Crop and animal production, forestry and wildlife, and land cadaster, agricultural irrigation and agricultural research and extension, conservation areas, management and monitoring of fisheries, fisheries research and technologies;
- **Health:** health, including environmental health as part of public health;
- **Mineral Resources/Mining**: geology, mining and fossil fuels;
- **Infrastructure, Natural Resources and Environment:** water, buildings, roads and bridges, housing and urbanization; production and distribution of energy (electricity, fuels and renewable energy);
- **Economy and International Cooperation:** tourism and respective hotel industry, as well as interventions in conservation areas related to tourism.

The Ministry of Infrastructures, Natural Resources and Environment (MRNEA) is in practice a “super-ministry”, which encompasses a range of sectors and sub-sectors under its umbrella. It is noted that being at the top of the main subsectors of infrastructure development while managing environmental management, it places itself in the position of a player and referee in cases in which the sub-sectors it covers carry out activities that require environmental licensing. Without necessarily being a fatal contradiction, it is an issue that at times raises valid concerns.

5.3. Brief the Regulatory and Institutional Assessment and Comparison with the World Bank Guidelines

The planning, implementation, monitoring and evaluation of TCP will certainly benefit substantially from the institutional arrangement and the regulatory framework for the sustainable management of environmental and social factors described above. The existing institutional and regulatory arrangements are also intended to ensure that all relevant sectors and institutions have a say in all important stages of the development of any project, including the TCP, regarding their environmental and social implications. This was also highlighted during the public consultation meeting in S. Tome on the 22nd of June and it is to be expected that the various stakeholders will be looking forward to seeing it being materialized strictly.

There has been significant progress in terms of definitions and adaptation on the ground to improve the environmental and social management, but some gaps remain even in terms of definitions and it has to be recognized to be even greater in terms of implementation and translation of existing provisions into practical value-added elements on a day-to-day basis.

For example, the tradition of preparing, conducting, implementing and of effective monitoring and evaluation of environmental and social impact studies and particularly the environmental and social management plans as well as resettlement action plans remain weak in STP. Especially the latter. Environmental consultants and respective companies are scarce in STP and one can hardly say that the country has a market and a constellation of institutions and practices around the ESIA, ESMP and RAP processes or their respective more strategic versions, e.g. ESMFFs, RPA, SESAs, Land Use Plans.

A well-known practitioner in environmental and social management in STP indicated that after more than 20 years of the Regulation 37/99 on Environmental Impact Assessment not more than 20-30 studies of this kind have ever been carried out in the country. For RAPs the situation is worse. This is quite little and certainly an indicator of lack of routines. Additional analyzes indicate that this seems to be justified by two main factors: (i) reduced investment that the country has been receiving since the adoption of the sustainable development principles; (ii) institutional weakness to enforce the provisions in force; (iii) local perceptions about the importance/relevance to put the existing instruments into practice.

Table 5-3, below, highlights the main similarities and differences between the laws and regulations of STP and the World Bank guidelines.

Table 5-3: Assessment of differences between STP legislation and the WB guidelines/requirements

Issues	STP legislation	WB safeguards requirements	Differences/Conflicts
Categorization of projects	The EIA is required by Regulation 37/99, but, other than indicating that after the preliminary assessment determining whether a project should or should not prepare an EIA, this Regulation does not provide a specific categorization of projects according to their expected impacts	Under the OP 4.01 WB projects are classified into three categories depending on the expected significance of their environmental and social impacts. Under Category A are those associated with more severe impacts and require a full ESIA, B those with less impacts so that in addition to the preliminary assessment a simplified ESMP can be sufficient and C those that have no significant impacts expected and therefore are exempted from preparing an ESIA even though they must follow the guidelines on good practices. The WB also has a F1 category that refers to investment funds of the Bank through a financial intermediary.	In the chapter of the Categorization of the projects there is a significant difference between the regulations of STP and those of the Bank. The latter will have to be applied in this matter and it is currently/already being applied.
Preparation of the Environmental and Social Management Plans	Although from the Regulation 37/99 text it is implied that for projects that require an EIA the exercise should lead to an ESMP that matches the management of impacts identified and measured, the Regulation is not explicit about it.	Under the OP 4.01 the projects that must be subject to an ESIA should culminate in the preparation of ESMPs which is intended to show how the different parties involved and interested in the project will deal with each of the impacts identified and measured	Although it is only one difference between omission and explicitness, the need to prepare ESMPs should be explicit for projects of categories A and B, which must prepare an ESIA. The rules of the Bank will have to be applied and are currently/already being applied
The environmental authority shall issue an environmental permit before any other assessment of a project	Regulation 37/99 makes it clear that the environmental license precedes any other license	The OP 4.01 requires the approval and dissemination of ESIAs by the relevant government authorities	In both cases the dissemination precedes the approval so that any concerns are raised and addressed before approving the project. Except for the practical issues that might lead to the license not being formally issued the regulation is clear about this. Adequate support and advocacy will need to be

Issues	STP legislation	WB safeguards requirements	Differences/Conflicts
			exercised/provided to ensure that TCP strictly follows what is legally established
Regulation of involuntary resettlement issues	STP has no legal instrument to directly regulate involuntary resettlement issues arising from project development. The Law of State Land Management and Ownership (Law no. 3/91) and other laws have partial aspects that can be used to ascertain restoration, compensation, etc. where a project interferes with the ways of living of individuals and other entities and their assets, but these are not organized into a consistent functional framework to guide an action plan. The country also has no tradition of resettlement actions	The Bank has general and specific definitions on how to deal with people and other entities when they and/or their assets are (involuntarily) affected by development projects. Depending on the cases, a resettlement action may include "(i) the loss of land or physical structures on the land, including businesses; (ii) physical movement, and (iii) the economic rehabilitation of those affected by the project (PAPs), economic displacement, in order to improve (or at least restore) income levels or existing livelihood before the action causing resettlement has taken place". The policy applies whether the person must move out of the area. And it has clear rules covering how to deal with each of the compensation issues and restoration of livelihoods that may arise and recommends structuring a cohesive action plan.	Both in terms of definition as well as in practice there are deep differences between the two realities, i.e. the STP and the WB. The wealth of WB guidelines and regulations will prevail in the orientation and preparation of the resettlement actions that may be raised by the project

Thus, TCP will benefit from the positive developments on the one hand, but it may also be constrained by the weaknesses that remain on the other side.

Ultimately, although it becomes clear that there has been greater harmonization between GSTP regulations and World Bank Safeguard Policies, the differences in a few areas and aspects remain, as can be easily seen from the analysis of Decree 37 /99, above. **Under the project, whenever there is a conflict between national legislation and the World Bank Safeguard Policies, the latter will prevail.**

As part of this project and this ESMF actions that should be taken to enhance the institutional environment and prevailing regulatory were also identified. The ESMF also presents a budget that should be mobilized to boost implementation in the subsequent phases of project development.

TPC Project implementation can be used to strengthen and consolidate institutional and regulatory change in more practical terms, among other interventions this could be achieved by:

- Making sure that AFAP environmental and social safeguards unit (which at present has only one specialist) has more capacity to influence the adoption of sound environmental and social management by INAE, DGA, Districts and Municipalities;
- In its turn the above will require (i) more environmental and social workers within AFAP itself and/or within INAE/DGA at least to manage TPC commitments; (ii) more capacity within AFAP/INAE/DGA, which could be achieved through (a) training and capacity building including internships and/or study visits by AFAP/INAE/DGA environmental and social personnel to countries with more practical experience in these areas; (b) dedicated technical assistance stationed at AFAP with ramifications to INAE/DGA to reinforce routines and recommended practices.

TPC is relatively a large investment in STP and is well placed to be used as an example of how environmental and social management should be done. Failure to embark on sound management carries some risks including reputational risks for all the agencies involved, especially if the expropriations along the EN1 are not done adequately. Chapters 8, 9, 10 and 11 of this ESMF present more examples of practical actions that can be adopted to influence chage.

6. ENVIRONMENTAL AND SOCIAL CONCERNS IN THE PROJECT AREA

6.1. Preliminary Socioeconomic Assessment of the Project Area

6.1.1. General Characteristics of the Households

An initial assessment of the socio-economic environment and potential impacts and perceptions of the project was undertaken at the preliminary stage related to the formulation of the environmental safeguards instruments (ESMF and RPF).

The exercise was based on two main types of methodologies, that is, qualitative and quantitative, to gather and process the various types of information. It was a mix if evaluation methodologies. The qualitative methodologies were based on (i) continuous literature review including the consultation of maps and other forms of information; (ii) conducting interviews, focus group discussions with relevant people; and (iii) direct observations in the field. Focus groups interviews and discussions were conducted particularly with (a) municipal authorities, and (ii) representatives of GIMEs.

The quantitative methodologies, which on the one hand express the attempt to gather more objective data on the socioeconomic environment, consisted mainly in the administration of a questionnaire (Annex 6) to the households (HH) that live along the EN1. Preference was given to registered HH living very close to the road at a level that already allows to predict potential interference with the expected rehabilitation actions.

As shown in Table 6-1 the exercise ended up focusing on 103 HH distributed by the three districts

Table 6-1: Distribution of the interviewees by district

District	Frequency	%
Água Grande	4	3.9
Lobata	78	75.7
Lembá	21	20.4
Total	103	100.0

It is evident that it is in Lobata district that there are likely to be more interferences between the road rehabilitation and local people while within this district the localities of Conde and Guadalupe are also those raising more concerns.

Table 6-2: Distribution of interviewees by locality

First Name	Frequency	%
Água Toma	4	3.9
Bairro da Liberdade	1	1.0
Bairro de Liberdade	1	1.0
Budu Budu	1	1.0
Budu-budu	1	1.0
Conde	29	28.2

First Name	Frequency	%
Guadalupe	24	23.3
Guadalupe Kilombo	2	1.9
Ilheu	9	8.7
Laranjeira	1	1.0
Menguana	1	1.0
Muandy	1	1.0
Neves	6	5.8
Quilombo	2	1.9
Ribeira Funda	4	3.9
Rosema Neves	7	6.8
Santo Amaro	9	8.7
Total	103	100.0

6.1.1.1. Demography, education and employment

The 103 HH represented 319 members, with the mode standing at 3 members (31%), followed by 2 members (23%), and in the third position the HH having only 1 member (18%). And in this case the average is 3 members per HH. This establishes a small contrast with the data from the 2005/06 INE[10] survey (accessed during the study), which states that "the average household size in the country is estimated at 4.5 people. The number of people per household is higher in the urban areas (4.8) than in rural areas (4.4)". But it is quite possible that between 2005/06 to the present day there has been some change or simply that the data collected are not necessarily representative of the overall population. This would be normal given the small size of the sample and its bias.

It was uncovered that 62.1% (64) of the total number of heads of the surveyed HH are male and 37.9% (39) are female. This coincides significantly with the results of the 2005 National STP HH Survey (QUIBB-2005, INE (April 2006), which states that "*of the total household heads, 63.4% are male-headed against 36.6% led by women*".

In general, 51% of the HH members are men and 49% are women. As a civil status 95% declared themselves to be unmarried and only 4% declared to be married while 1% indicated being widows/widowers. 94% live in the surveyed houses and only 6% reported being absent, usually out of the country working and/or studying.

Regarding the level of education, Table 6-3 shows that those who cannot read or write represent only a little less than 7%. The remainder are divided by various levels and types of education, including university degree holders (close to 7%).

Table 6-3: Levels of education by the HH members

Education Level	Frequency	%
None	21	6.5%
Can read and write your name and some numbers	9	2.8%
Kindergarten/School	7	2.2%
Primary (1st/7th grade)	56	17.3%

[10] National Institute of Statistics

Education Level	Frequency	%
Secondary I (8th/10th grade)	62	19.2%
Secondary II (11th-12th class)	82	25.4%
Vocational Training/Basic Level (8th/10th grade)	41	12.7%
Vocational Training/Technical Level (11th-12th grade)	13	4.0%
University	22	6.8%
Do not know	10	3.1%
Total	323	100.0%

The employment situation confirms the significantly precarious situation in which the members of the HHs find themselves in. Only about 32% reported having formal employment. The remainder (also after taking out the minor children and students) are distributed as shown in Table 6-4.

Table 6-4: Employment status of the members of the HH

Employment	Frequency	%
Children (under 5 years old)	9	2.8%
Students	102	31.8%
With formal employment (formal contract and regular salary)	51	15.9%
With informal employment (no contract or formal agreement)	37	11.5%
Seasonal Worker	5	1.6%
Self-employment	56	17.4%
Unemployed (actively seeking employment)	35	10.9%
Domestic (not looking for a job)	17	5.3%
Retired (receiving pension)	2	0.6%
Disabled and not employed	7	2.2%
Total	321	100.0%

Outside the domestic work of those who work the main occupation is agriculture side by side with teachers/nurses, commerce and others.

Table 6-5: Main area of occupation of the members of the HH

Area of occupation	Frequency	%
Agriculture	30	14.6%
Fisheries	4	2.0%
Handicraft	2	1.0%
Housework	45	22.0%

Area of occupation	Frequency	%
Shopping (store)	27	13.2%
Trade (tent or other informal business)	20	9.8%
Mobile retail or on the ground	6	2.9%
Unskilled worker (no skill - e.g. housekeeper)	18	8.8%
Skilled worker (skillful, self-employed)	18	8.8%
Professional (with formal contract - teacher, nurse)	29	14.1%
Other (please specify)	6	2.9%
Total	205	100.0%

The most important employers are distributed as shown in Table 6-6, below.

Table 6-6: Main employers

Employers	N	Percent
Government	44	24.2%
Private company	19	10.4%
Individual	37	20.3%
Self-employment	73	40.1%
Relative (with remuneration)	7	3.8%
Relative (without remuneration)	2	1.1%
Total	182	100.0%

Most people (close to 70%) develop their own businesses (personal or family), followed by those working for the government and finally for the private sector as such.

6.1.1.2. Housing, possession of goods and access to services

As for the time in which the HHs have been living in the project area it was uncovered that some of them have been there from 105 years to only 1 (one) year. The mode is made up of those who have been there for 20 years (10%) and then there are very scattered values although the 20 years are followed by 12 years (7%) and 2 years (6%).

Table 6-7: How the house in which the HH currently lives was acquired

Mode of acquisition	Frequency	%
Self-construction	61	64.9
Purchase	3	3.2
Heritage	16	17.0
Received as donation	4	4.3
Rent (pay rent)	10	10.6
Total	94	100.0
No information	9	
Total	103	

Nearly 65% of HHs live in self-built homes, followed by those who received them by inheritance (17%), and thirdly, those who rent and pay rent (close to 11%).

The HHs have a series of trees where the "fruit tree" (“fruteira”) predominate, but in general the numbers are dispersed and do not present significant levels of concentration. The same goes for the possession of animals.

The main mode of locomotion of people is by foot (close to 50%), followed by paid motorized private transportation (30.4%). The use of personal transport (8.4%) and the public itself (7.4%) is still low.

Table 6-8: Main mode of locomotion by the members of the HHs

Mode of transportation	Frequency	%
On foot	154	49.8%
Personal Car	26	8.4%
Free transportation in private motor vehicle	10	3.2%
Paid transportation in private motor vehicle	94	30.4%
Public transportation	23	7.4%
Other	1	0.3%
No information	1	0.3%
Total	309	100

The picture shows relatively serious transport deficiencies, which can also be seen by the precarious means in which many people are transported in the project area (e.g. motorized and sometimes open carts). The costs of maintaining vehicles due to the precarious state of the roads and the costs that this translates into for the users and owners of the vehicles are certainly behind this scenario.

However, the need to travel seems to be great, as close to 60% of the respondents indicated that they do it "every day" and to move "in and around the same neighborhood" (27%), "to visit other neighborhoods" (25%), “in the same locality” (8.5%), “in the same district” and (22%) and “to go to the nearest city” (17%).

Table 6-9: Reasons for locomotion

Reason for travel	Frequency	%
Going to the agricultural field	33	10.9%
To work	72	23.7%
To study	92	30.3%
Make business	14	4.6%
Purchase	39	12.8%
Go to the hospital	2	0.7%
Go to the church	6	2.0%
Visiting family/friends	23	7.6%
Walk/leisure	23	7.6%
Total	304	100.0%

The reasons are presented in Table 6-9, which emphasizes the primacy of using transport to go to school, followed by going to work to go shopping and go to the agricultural fields.

6.1.1.3. Knowledge and perceptions about the project

The Transport and Coastal Protection Project (TCP) is still little known in the project area. This is conveyed by the fact that only 23.3% have mentioned having ever heard of it.

Table 6-10: Main sources of information about the project

Information sources	Frequency	%
Friends/neighbors	7	29.2
Press (radio, television, newspapers, magazines)	11	45.8
I participated in project presentation/discussion meetings	2	8.3
Heard rumors	4	16.7
Total	24	100.0
No information	79	
Total	103	

Sources of information vary, but the press (46%) and friends/neighbors are dominant. There is a certain prominence of knowledge through the “hear say” (rumors).

Nearly 65% of the respondents stated they were either very happy or happy with the project. 20% indicated waiting to see and close to 14% have no opinion and only 2% have declared themselves unhappy with the same.

In case of resettlement compensation preferences for the main areas of potential loss (i.e. infrastructure, trees, crops, etc.) are dominated by substitution followed by cash compensation.

6.1.1.4. General considerations

It is noted that the project is already somehow known, although this is still by a small number of people. People generally have few opinions about the project and are not aware of the possible environmental and social implications, especially since, unlike in some countries, resettlement actions are still not common in STP.

In certain countries barely speaking of road rehabilitation people soon evoke the issue of resettlement, which is sometimes accompanied by many types of reactions that can range from rejection to opportunism that can translate into “con” investments in the right-of-way and/or impact corridor only to claim compensation. So far, none of these aspects are apparent in this case.

Even the issue of employment opportunities has only been elaborated by representatives of GIME, who have received more systematic information about the project and expect to be able to have an increased source of work which, given the latest developments, since they were established in 2005, could be one of the most significant jobs they've ever been involved in. It is noted that GIME harbors a great expectation regarding the project that should not be defrauded, once the conditions are ready.

As for the remaining groups of people the public meeting to present and get feedback about the ESMF and the RPF was the most comprehensive open moment. Thereafter efforts should be made to make the main actions more public and informative, albeit without creating false expectations or spreading unjustified fears. The process of ESIA and ESMP preparation currently underway should be particularly used for this purpose.

6.2. Main Environmental and Social Concerns Related to the Project

In addition to the direct observations and findings of the Consultant as well as data from interviews with a limited number of informants, including those obtained from GIME/FENAME members, there was, on 22 June 2018, at the United Nations building, in the City of São Tomé, a public meeting to present the Drafts of the ESMF and RPF and obtaining feedback from the participants on the project itself and on environmental and social safeguards instruments. The minutes of this meeting are presented in Annex 1.

The following lines present a summary of the main issues that seem to concern the different entities regarding TPC development.

1. The different stakeholders, especially those in the areas of transport, general infrastructure that normally coexist with roads (e.g. energy distribution, telecommunications, water supply and sanitation), engineering laboratory services, etc. believe the TPC has a considerably structuring character. Therefore, it is advisable to not develop it without proper consideration of what the interests of these entities can be in relation to its several characteristics such as road geometry, alignment with other developments to make sure that in specific and agreed timetables the other complementary elements are developed without creating additional disturbances/losses;
2. Also related to the above subject, the Tourism sector understands that the development of the road should not be done at the expense of de-characterizing the area with respect to its enormous potential for tourism. The panoramic features typical of the area that give it its own San Tome identity should not be forfeited in the name of the convenience of the transport sector and without regard to tourism attractiveness;
3. In a more direct way the roads rehabilitation actions should go hand in hand with a work of converting the current fleet of vehicles characterized by being obsolete and therefore harmful to the roads. Other interventions are necessary aimed at giving the country newer and less polluting cars, especially those providing public service (collective transport and taxis);
4. There is concern about the type of interventions that will be adopted to stabilize mountain slopes from where it is possible to emphasize the interest in not seeing everything being solved using “concrete”. “Green” measures should be adopted as far as possible. While at the same time providing security, they will lend a more aesthetic and healthier environment;
5. The Rehabilitation Scenarios to be adopted should not be seen in a juxtaposed way, i.e. that the different Scenarios are not mutually exclusive. As many combinations as those necessary to respond to the various conditioning factors (i.e. environmental, social, technical, economic, financial, etc.) should be considered;
6. While GIMEs believe that the rehabilitation actions foreseen in the two infrastructure components of the project offer a unique opportunity for the materialization of the mandate for which they were created in 2005, there are those who do not think that all the labor-intensive work should be given to these groups. There should be dedicated efforts to involve other members of the public not directly linked to GIMEs;

7. Both private and public entities, singular and collective, are concerned about how exactly the project will address the different categories of impact on their livelihoods and/or assets. What kind of compensation will be associated with each category of affected people/assets?
8. It is also necessary to take reasonably concerted measures to prevent “opportunistic” actions from different categories of entities who could use the knowledge that they may have about rehabilitation actions in order to engage in “bad faith” occupation, only for them to be able to claim compensation.

Even so, a part of public opinion is in favor of a rehabilitation action that introduces major changes because it is understood that this is what the road (mainly EN1) needs at this moment.

In the subsequent phases of development of the two infrastructural components of the project and beyond, all these issues must be duly considered and addressed in terms of the dissemination and involvement of the different interested and/or affected stakeholders.

7. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

During planning, but especially during construction, operation and maintenance and eventually during project decommissioning activities there is the potential to interfere positively and negatively with the various components of the natural and social environment. The ESIA will make an inventory of all impacts and for each identified impact the following evaluation criteria will be used:

- Nature of impact (positive or negative)
- Recipient or resource affected (soil, water, air, cultural, social, economic, historical, aesthetic)
- How the project affects the receiver (directly, indirectly or cumulatively);
- The probability of occurrence;
- The scale of space (extension); and
- The time scale (duration).

Then, for each of the impacts, management measures will be drawn up, which in turn will be captured in an ESMP and in the Resettlement Action Plan (RAP). A preliminary identification and evaluation of these impacts is presented in the subchapters below, and some management measures to be subject to more detailed investigation during the preparation and implementation of the ESIA/ESMP and RAP are also outlined.

7.1. Potential Impacts on Physical Environment

7.1.1. Soil Erosion and Sedimentation

Erosion can be expected in areas where the soil is disturbed and exposed subject to intense precipitation. The clearing of vegetation in geometric improvement of sections of roads or widening the tracks, building bridges, culverts, extraction of sand in sandpits will expose the soil to erosion during the rainy season and may result in increased erosion and sedimentation of watercourses. The increased erosion during construction and operation can further contribute to clogging of rivers.

The project may involve both superficial and deep excavation. This will result in erosion especially on sections with steep gradient.

Other areas associated with road can contribute to soil erosion, including temporary deviations, curbs and parking areas.

Indirect and cumulative impacts

Erosion has impacts on soil impoverishment and the deposition of particles in waterways affects water quality, impacting on aquatic and marine fauna and flora. The cumulative impacts of erosion on water quality are temporary and particularly localized to watercourses along the project area. Thus, the mitigation measures below should be implemented to prevent erosion.

Mitigation Measures

- Restrict, wherever possible, construction activities during the dry season to reduce the risk of erosion;

- Minimize work in or along rivers such as sand removal or collecting water from these rivers for building;
- Use machinery with rubber tires instead of metal pads, particularly those that will work in the bridges to allow less disturbance of soil and vegetation;
- For stabilization of slopes particularly along the sections with steep gradient and in the vicinity of the drainage works, and where possible make use of gabions to prevent erosion;
- Use of native vegetation in disturbed areas to allow rapid recovery of stabilized soil
- Construction of drainage structures, particularly in sections with steep gradients;
- Restore and re-vegetate the sandpits.

7.1.2. Soil and Water Pollution

Nearly all wastes generated during **construction**, except the gases are eventually deposited on the ground. The largest sources of pollutants include camps, storage areas and civil works. Effluent and runoff from camps and storage areas can contain high levels of pollutants including human waste, free components from asphalt compounds, persistent organic pollutants, fuels and oils, bitumen and cement particles, detergents, heavy metals and corrosive substances from old batteries and antiseptic substances, salts and other elements. These pollutants can increase the BOD, COD, fecal coliforms, STD and nutrients when they reach waterways after runoff. The camps can therefore be a very important source of pollution to waterways.

The civil works result in movement of soils that may be carried by the rain to the nearest watercourses increasing turbidity, nutrients and STD, and thus reduce the quality of the water. The magnitude of the impact on the rivers that will be affected by the pollutants will depend on the location of camps and nature of the civil works.

Other sources of pollution of rivers are the asphalt plants, quarries and sandpits. In areas where there is the asphalt plant, the pollution of both surface and ground water may occur due to leakage or escape of substances used in the production of asphalt and/or improper storage of lubricants and other building materials. At the sandpits and quarries, there is the possibility to intercept the water table during excavation.

The impacts of the road **operation** on water quality are sporadic in case of road accidents. The damaged vehicles can release fuels and oils after an accident and can be washed or drained towards the waterways. The probability of occurrence is relatively low and depends on the location and magnitude of the accident as well as the vehicles involved.

During **decommissioning**, solid waste and debris as obsolete or damaged materials as well as waste water can be washed out to the waterways and adversely affect its quality.

Water pollution has direct impacts on aquatic fauna (see below).

Mitigation Measures

- Implement erosion mitigation measures (see below);
- appropriate treatment of solid waste (to be included in the ESMP);
- storage and proper handling of fuels, oils, lubricants, paints, tar and other substances to prevent spillages and leakages;
- Regular maintenance of machinery and vehicles to prevent leakage of oils and fuels their systems; appropriate treatment of waste water on construction sites, quarries and sandpits;

- Better signaling of bridge sites and steep slopes to reduce the risk of accidents and spills;
- Proper location of the construction sites, sandpits, quarries and asphalt plants to prevent runoff to watercourses;
- Ensures maximum emission limits for domestic effluents according to environmental quality standards and effluent emissions.

7.1.3. Generation of solid wastes

The road construction activity generates a huge amount of waste that must be managed properly to avoid pollution. Table 7-1, below, shows typical activities of similar project, type of waste and its features, although these do not cover all.

Table 7-1: Typical project activities, solid waste and general characteristics

Project activity	Residue	General characteristics and sources
Construction and construction site operation	domestic solid waste	food scraps, packaging material (plastic bottles, cans, paper), old fabrics, wood, metal, grass, etc.
	solid waste warehouses	Material damaged or obsolete (cement, explosives, metals, plastics, paper, old batteries, etc.)
	Waste from demolition	Debris (sand, blocks, wood, metal, plastic, cement, asphalt, lime, oil, etc.
Operation of quarries	Solid waste	Inert
vegetation cleaning along new alignments and berms of the existing road to extend	solid waste and debris	Stems and branches of trees, grass, topsoil, sand, stones, etc.
Cutting and filling for changing the vertical alignment of the road, removal of the surface layer to facilitate the construction of road infrastructure and	solid waste	spoils
Construction-related road and infrastructure including bridges, aqueducts, parks, sidewalks, signage and other drainage infrastructure	solid waste	Mud, stones, pebbles, cement, metal, wood
Demobilization	solid waste from demolition	Debris (sand, blocks, wood, metals, plastics, cement, asphalt, oils, etc.)
	general waste	Obsolete or damaged materials (cement, bitumen, explosives, metals, plastics, paper, etc.)

Mitigation Measures

- Measures for waste management will be included in the ESMP this ESMF outlines the following general principles:
  - Approve specific norms on waste management;
  - Define the mode, process for waste removal and means to do that, transport, disposal and treatment of waste;
  - Set fees, provide waste collection, transport, disposal and treatment services;
  - Provide license to entities who can provide hazardous waste management.

7.1.4. Impacts on topography (landscape)

Under landscape point of view, the road is likely to bring a better look to the location than the current state. One of the biggest impacts of road rehabilitation could be the impact on the topography caused by the operations of quarries and sandpits both during construction and in operation. Measures can be taken to re-vegetate the area and make it more attractive, but it will be irreversible recovery from existing current topography in the areas of sandpits and quarries. The impact can be expected to be of medium magnitude and can be managed by applying appropriate mitigation measures to reaching the medium significance.

Mitigation Measures

- Only licensed quarries and sandpits should be used for the project; if there is no licensed sandpits and quarries, the contractor or sub-contractor shall establish one by means of a separate environmental permit;
- Management Plan Compliance with sandpits and quarries;

7.1.5. Air Quality and Climate Changes

Some project activities could contribute to air pollution and climate change. During the **construction phase**, the sources of air pollution include fumes from exhausts of vehicles and construction machinery, waste burning, volatile substances such as fuels and solvents, asphalt fumes, dust from construction works, explosions in the quarries and operations in sand pits. The primary pollutants of such activities include: sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO), carbon dioxide (CO2), volatile organic compounds (VOC), particulate matter, chlorofluorocarbons (CFCs) ammonia (NH3), odors, furans and difurans, radioactive pollutants. The main secondary pollutants include suspended particles formed by the primary pollutants and compounds formed from photochemical reaction of pollutants such as nitrogen dioxide; ozone formed from the reaction between NOx and VOC.

The rehabilitation of the road will result in a release of a considerable amount of long-term greenhouse gas emissions. During construction, greenhouse gases can be emitted from burning waste, operation of vehicles and machinery and decomposition of waste.

During **operation**, emissions from agricultural vehicles and equipment will increase substantially. STP is still importing sulfur-based fuel and there is no age limit for imported vehicles. Older vehicles tend to release more greenhouse gases than the new ones. The significant increase in traffic along the road will therefore contribute significantly to climate change in the long term, even though they travel at a more efficient speed with improved circulation conditions. It should be noted that there will be a decrease to practically zero with respect to particulate matter that is currently chaotic.

Despite the expectations of an increase in air pollution and the consequent effect on climate change, the project will allow good circulation and dispersion of gases released by cars. If measures such as vehicle maintenance and maintenance of vegetation are taken, the impact could be mitigated to lower significance levels.

Indirect and cumulative impacts

Air quality along EN1 and the S Tomé Coastal Coast will be dependent on several factors, such as expected increase in traffic, measures to control the status of vehicles circulating through periodic inspections, regional changes in air quality and climate change. EN 1 rehabilitation is expected to influence the development of other similar projects in the region and attract more traffic. Thus, the cumulative impacts of the project may be significant.

Mitigation Measures

- Control during the annual inspection of vehicles;
- Sprinkling of water on construction areas to prevent dust;
- Proper location of quarries and sandpits, i.e. far from the areas of concentration of people and conservation areas;
- Approve regulations that will limit the maximum age of imported vehicles;
- Create facilities for the purchase of new vehicles, particularly for passenger and cargo transport services.

7.2. Potential Impacts on Biological Environment

7.2.1. Loss of Natural Habitat

During the **construction phase** there might be need for logging in some sections where a new alignment, road widening, and diversion will be carried out to facilitate works. Moreover, in the areas dedicated to the construction sites, the extraction of aggregates (sand and stone) may occur. The borrow pits currently used for road maintenance are small and are expected to be extended. As a result, there will be a destruction of the natural habitat. The occurrence of this impact during construction is localized as for the most part, the section will only be rehabilitated. Its impacts in units such as construction sites, quarries and sandpits can be mitigated through recovery plans.

Habitat destruction during the operation phase due to migration from rural communities to the vicinity of the road, leading to deforestation for the purposes of construction of new homes, opening new farms and wood harvesting to produce coal or own consumption has the potential of occurring. Additionally, the easy access by road may encourage illegal logging, more coal production for sale including the danger of these activities affecting the PNOST conservation area. Yet improved access may allow forest concessions to increase their annual cutting volumes that are now limited by the difficulty of access. This impact during the operation phase is long term and can be irreversible if no action is taken. Coordination between the departments of agriculture and the environment to control deforestation during the operation phase will be required.

This impact is likely to occur in the surrounding area. Due to its catalytic effect the development will attract more people in the long run. However, it may be reversible if mitigation measures are taken to reduce the high significance on the average.

Mitigation Measures

- Limit the area occupied by the construction camp;
- Transfer buildings to the road maintenance services of the ministry in charge of roads as well as other entities;
- Rehabilitate all quarries and borrow pit operation areas;
- Compensate the felling of trees by reforestation and planting of roadside trees in the villages and towns crossed by roads;
- Involve and strengthen the need for coordination between public institutions responsible for the area of agriculture and environment to monitor deforestation during the operation phase;
- Develop awareness campaigns about environmental conservation in the communities;
- Strengthen the control to ban any illegal logging and monitoring compliance with management plans for forest concessions, particularly the allowable annual cuts;
- In partnership with NGOs, department of agriculture and existing forest concessions, develop and/or strengthen reforestation projects in communities;

- Promoting alternative livelihoods for the community to reduce the use of forest, e.g. honey production;
- Provide alternative sources of energy for cooking food and heating in the construction sites;
- Proscribe the use of fuelwood by workers during construction;
- Increased monitoring of forest licenses and logging, particularly within the PNOST;
- The Contractor shall provide these basic products to their employees and not allow any use of natural resources;
- Cutting trees for purpose of alignment enhancement should be done after prior authorization.

7.2.2. Interference with animal migration

Although over a large part of the road there is already an insignificant movement of animals during the **construction phase**, the large movement of vehicles and machinery may be associated with the risk of disturbance of the fauna that may be increased, particularly in the migratory corridors of animals such as birds and nesting areas. The constant presence of workers and machines can prevent or hinder the presence and migration of animals. However, this impact can be minimized by limiting the establishment of construction camps near animal migratory corridors.

Mitigation Measures

- Build far away from migratory corridors;
- Prohibit any form of hunting by workers;
- Identify and demarcate animal migration corridors of animals;
- Put sound and speed humps to reduce the speed of motorists in areas of animal crossings.

7.2.3. Increase in illegal hunting of animals

This impact is particularly important during the **operation phase** due to the easy access that is expected with the road rehabilitated by the poachers and meat/wild animals buyers. During the construction phase this can be avoided through hunting prohibition for construction workers, awareness and constant monitoring.

Mitigation Measures

- Ban any form of hunting by workers;
- Promote awareness campaigns on the protection of animals and nature with the workers and communities;
- Promote alternative sources of protein for local communities;
- Promote partnerships with private investors to develop projects that combine conservation and tourism;
- Strengthen enforcement against poaching, especially in collaboration with local communities.

7.2.4. Disturbance to aquatic and marine flora and fauna

The impacts **during construction** can be caused by the resulting sedimentation due to work to be done in riverbeds and marine areas (sand extraction and water abstraction), erosion in the areas of construction, pollution by oil, fuel and other chemicals. Large amounts of eroded sediments in rivers and sea (during the rehabilitation of bridges and culverts and coastal protection interventions) that can directly affect flora, fish and aquatic life in general

downstream through damage or accumulation in their gills leading to death or sub-lethal effects. Sedimentation can indirectly affect fish by modifying the habitats or reduce primary production and therefore the amount of fish. Spillage of Fuel and chemicals can directly affect the aquatic flora and fauna or the availability of fishery products for humans. In addition, water abstraction from the rivers can disturb the aquatic fauna or affect their integrity depending on the amount to be collected and the source.

During the **operation and road maintenance phase**, surface and marine water can be polluted by vehicles crossing the road. Small spillage of oils and fuels from vehicles in poor condition and asphalt compounds can be washed in to the watercourses and sea. This impact is minor and of short-term. Thus, it is probable that the operation and road maintenance will have little significant impact on water resources and sea water. In case of traffic accidents, it is to be expected that higher volumes of spilled fuel and oil on the road can be washed into rivers. In these cases, the impact can be moderate to severe, depending on the amount of fuel spilled. Severe, irreversible and permanent cases can happen from an accident caused by fuel tankers. Therefore, impacts on water quality can be significant, requiring the adoption of mitigation measures to be incorporated during the operation and road maintenance.

The **decommissioning** of structures located on or near water courses may have some minor impacts on the water quality and ecology of rivers. However, general mitigation measures should be applied in case there is the risk of this kind of contamination to reduce their impact to a minimum.

Mitigation Measures

- Compliance with erosion control measures (see above (impacts and management related with the physical environment));
- Regular maintenance of machinery and vehicles to prevent leakage of oils and fuels;
- Better signaling of bridges and steep slopes to reduce the risk of accidents and spills;
- Proper location of the construction sites to prevent runoff to watercourses and sea water.

7.2.5. Use of Resources

The workers engaged in the road construction works will increase energy demand, wood, sand, stone, fuel, food and water.

Access to Food can be provided by suppliers in and around S. Tomé, Guadalupe and Neves subject to the availability of food at the local level. There are also fuel pumps to supply the project, since that is provided for in advance subject to the local supply.

A feature that is particularly important in the construction of roads is water and it will put pressure on local sources. Large amounts of water are needed for the compaction of the sub-base, reduction of dust during the work, concreting of drainage structures, and supply to the construction sites, sandpits and quarries. Although it is temporary, depending on the amount and source to be extracted, it can cause impacts on water availability for the surrounding populations and affect the aquatic fauna of the source. There is no new water course realignment in the project. Thus, the construction activities will have significant impacts on the change in the hydrological regime of the water courses in the short-term.

Mitigation Measures

- The Contractor shall provide these basic products to their employees and not allow any use of natural resources.

- Licenses should be obtained from supervisory institutions for the exploitation of local resources;
- Procurement should consider purchasing products sold by local merchants and avoid building autonomous facilities. This could be an additional way of using the project to expand the sharing of benefits with local people/entities.

7.3. Potential Impacts on Social Environment

The project is clearly associated with a variety of beneficial impacts on the socio-economic environment. These should be optimized, and the few potential negative impacts avoided and/or minimized to the maximum. Some of the most important of these impacts include, but are not limited to:

7.3.1. Job Creation

During **construction**, one of the direct positive impacts of the project will be the creation of employment and business opportunities for local communities and entities that will supply goods and services to the project. The Contractors will employ skilled and unskilled labor for the execution of the contracts, such as socio-economists, engineers, professional technicians, security, casual workers, cooks, cleaning staff to the sites, among others. The execution of works can increase income for local people and organizations improving their current conditions. Even during construction, there are indirect employment opportunities through other local services such as small businesses and services to be provided for workers in construction and construction sites in general. Among the small vendors, including women are the elderly and the poor. Within this project there is an intrinsic interest in deliberately engaging GIMEs and labor-intensive works where this is applicable as one of the ways to lower costs and increase the possibilities of benefit sharing. This will need to be properly considered in the project design.

The **operation** of the road means more traffic and more people using the road. This may create self-employment opportunities for small businesses for sale of local products and not only for travelers. Additionally, small businesses (ex.: passengers) may employ more people.

Road **maintenance** activities create job opportunities for national companies and for the poor local population with no formal education, as could be the case of members of the GIMEs and the women that these represent. The companies may include small/medium-sized construction companies for repairs and maintenance of roads. This will bring an increase of income for local communities and possibly improve their living conditions.

Important local organizations are the GIMEs, which bring together a little more than 70% of members who are female. Their recommended involvement in maintenance works (and where possible also in construction) will bring increased incomes to local communities and possibly improve their living conditions, especially those fo women who might otherwise have no other opportunities.

All activities relating to demobilization and dismantling of sites and restoring of damaged areas can also create employment opportunities for small businesses and the local communities.

Improvement measures

- Ensure the involvement of the local structures and the communities that live along the sections to be benefited directly by the employment opportunities necessary to carry out the works;

- Employment opportunities should be explained clearly and realistically not to raise false or too high expectations;
- The Contractors shall prepare lists of the type of hand-unskilled labor needed, clearly indicating the number of posts, duration, working conditions and remuneration;
- Create opportunity for small traders and suppliers of local goods and services to serve the Contractors during the execution of works;
- The positive impact on women's living conditions can be encouraged further if the Contractors have specific orientation to give opportunity to women at the time of hiring of unskilled labor;
- All contracts and relations established between the employer and employees must be guided by the national labor law.

7.3.2. Increased agricultural and forests production

The workers engaged in the road construction works will increase the demand for agricultural and livestock products and forestry (timber, fuel wood, food, and others), which can encourage local production.

The poor state of roads is one of the main constraints to agricultural marketing in STP and the area of influence of the project is a good example of this situation. During **operation phase**, a bigger and better exploitation of forest concessions, increased agricultural and greater marketing production areas can be expected. This increase will be the result of the improved circulation conditions that facilitate the placement of their products on the market. Additionally, the situation may be related to the increased availability of agricultural inputs or by using public programs as well as NGOs or private sellers, encouraged by the demand for these services by producers. This will result in higher family income of the households and operation of plant and animal production companies in that section.

Improvement measures

- Increase access to agricultural extension services to local producers;
- Deliver more agricultural inputs to encourage local production;
- Implement the mitigation measures listed in the project impacts on the biological environment and management measures to prevent habitat destruction and to prevent illegal hunting of animals, especially in the conservation area (PNOST).

7.3.3. Attracting of investments

The road construction works will attract companies and investors both during **construction** and **operation phases**. Improved mobility conditions can be expected to propel or attract investments that are currently operating on a limited way or that are not triggered because of the related operating costs associated with the poor state of the road. Among the investments that can be attracted by the good road conditions are: agriculture, tourism, timber industry and transportation.

New investments mean more jobs and consequently improvement of living conditions of local communities.

Improvement measures

- Increased monitoring of forest concessions;
- Involvement of the promotional institutions of agriculture, tourism, timber, transportation, etc. to attract investment to the region.

7.3.4. Increased revenue for the state

During the road **construction**, the contractors will be required to import some materials that require custom clearance and hence generation of revenue for the state. Additionally, the creation of direct and indirect jobs during the construction will increase the local tax base with direct effect on the tax revenue.

During the operation of the road, a large increase is expected in the movement of people and goods in the project area and beyond, with direct tax revenues to be collected from these activities. Additionally, it can be expected that the number of contributors will grow due to jobs creation in trade and other investments attracted by the improved road.

One can therefore conclude that, indirectly, the project may contribute to state revenues to be used to invest in other social infrastructure throughout the country.

Improvement measures

- Improve the revenue collection system by the tax authorities and the careful allocation of resources to ensure an adequate flow of funds for O&M of public and municipal roads and infrastructures.

7.3.5. Reduction of transport costs

long distances, high transportation costs, poor road and lack of transportation is a major challenge for poor and vulnerable communities (women, children and the elderly) to have access to markets, financial services, health centers and schools and vibrant community life in general. The transport cost is unbearable for the communities living along the road, almost prohibitive, hindering access to all basic services. Improved road conditions will allow existing carriers and new interested operators to introduce buses with capacity to carry more people and at a lower unit cost than current situation. Moreover, there will be reduced maintenance costs due to improved conditions of circulation. Thus, the operators should reduce the transportation costs.

Cumulatively and indirectly the reduction of transportation costs will provide an increased flow of goods and people, increased agricultural production and marketing, better access to basic services, etc., i.e. with direct impact on the living conditions of the poorest and vulnerable population.

Improvement measures

- Ensure the involvement of local associations of carriers to participate in the operation of the road section in the transportation of goods and services;
- Together with the protection of institutions, establish adequate tariffs for the transportation of goods and people;
- Create parking conditions with safety and convenience in the main stations/destinations.

7.3.6. Social Inclusion and Community Participation

Communities living along the EN1 have limited mobility due to their economic, social or physical dependence. Women, particularly the poor and those who have children, tend to be economically dependent on their husbands; young people and children and dependent on their parents and the disabled dependent on their relatives. The spatial isolation, poverty and

social exclusion, prevent people from getting out of poverty. Thereby improving access and mobility is crucial to reduce the isolation and dependence of women, youth, the elderly and people with disabilities and thus facilitate their participation in the economic, social and political processes.

People will visit each other more often once the road is in a better circulation condition and this will strengthen ties in the community bonds among its members.

Improvement measures

- Strengthening of public, private and NGOs i initiatives n the areas of training, social services, education and health awareness, etc. especially for the most disadvantaged (elderly, children, differently able people, combating poverty associations, etc.).

7.3.7. Improved Access to Social Services

The improved road will contribute to improved mobility and therefore to improved access to health services. Additionally, it will help expand the distribution of medicines and facilitate the safe and timely transport of patients from other health facilities to the referral health facility in S. Tome, for example. Access to health services is particularly important for the treatment of chronic diseases such as tuberculosis, HIV treatment and other preventive treatments and/or immunization among communities with limited access to transportation.

Additionally, other services will be closer to the citizens, e.g. better access to other services such as birth registration. In addition to facilitating the work of the police, it is expected that the local governments will be closer to the relatively isolated communities due to the difficult conditions of mobility on the road.

Improvement measures

- Provision of basic social services to the local community.

7.3.8. Potential Impacts on Gender

The positive impacts of the project on employment opportunities, income generation, potential for increased local production, attracting investment, increased tax revenue, greater access to public services can have a significant impact on women. Women are directly engaged in the activity of agricultural production and small businesses that can prosper throughout the year, with rehabilitated roads and the coastal/marginal areas.

Improvement measures

- The important aspects to consider with respect to the gender issue are to ensure that the project design and implementation recognize that men and women have different needs and transport constraints and that they are affected differently by such projects;
- Through own internal policies and/or set in the contract, establish a minimum quota of direct participation of women in project implementation activities.

7.3.9. Expectations on the short-term solution for road access and lack of employment

Given the importance of circulation problems and consequent relative poverty along the EN1, the project creates very high expectations in the population of the impacted districts and cities

and particularly in communities living along this road as an immediate solution to all problems. However, there are steps to be followed for materialization of the project and subsequent use of the benefits of this important infrastructure. The rehabilitation of the coastal/marginal areas are also promising in terms of promoting local business and employment opportunities. Apart from the specific improvement of access, there is a huge expectation for resulting employability from the project.

Mitigation Measures

- Dissemination of information in the local communities as to the scope of the measures to be taken in the short term, to prevent false expectations and to ensure the credibility of the project among the communities;
- Coordinate with local authorities, local and traditional leaders on the timing of the development process and the project implementation goals.

7.3.10. Conflicts between workers and local population in the project area

Large projects (and this project is significantly large for the STP conditions at present) often generate social conflicts between workers who are temporarily in place and resident community. These incidents are generally related to socially unacceptable behavior contrary to the local social standards, for example, cases of drunkenness and disregard/disrespect towards local customs. Although part of the manual labor will be recruited locally, this impact should be considered not only in the case of other workers from other areas, but also with respect to the local workers which could lead to social unrest in the community once some of the members start having regular income while their seasonal jobs last.

Mitigation Measures

- Reinforce the importance of maintaining a good relationship with the local communities in dialogue with the health and safety workers;
- Among local workers there should be a liaison group with the community responsible for establishing communication between the project staff and the community, which is particularly important in cases of conflict. This group should be familiar with the project in general and be able to properly eliminate any difficulties or pass on any complaints/claims;
- Asset of rules (or a Code of Conduct) must be established and implemented in the workplace. The standards should include, among others, the prohibition of entry of outsiders or unauthorized to project premises and the prohibition of prostitution in the construction sites and related areas (e.g. .: storage areas).

7.3.11. Destruction and loss of assets

Throughout the section there are several assets (parts of houses (stairs, walls, walkways), trees, businesses, poles, etc.) that are located on the road's right of way. Even though it looks possible to avoid having to relocate people to make road rehabilitation possible, parts of houses as well as trees, bunkers, fences and fields, etc. may be affected by the rehabilitation of the road, specifically when making some detours and localized realignments to improve the road geometry.

Mitigation Measures

- A Resettlement Action Plan (RAP) or more than one RAP will have to be prepared for the Project in case the need for land expropriation is unavoidable. The RAPs will

contain all the mitigation measures necessary that should be implemented before the start of works;

- When the Contractors accidentally damage any structure or property of the people, they should undertake the necessary compensation in coordination with the Local Authorities and the project Developer. Fair compensation must be paid to cover, among others the loss of tangible and intangible assets, disturbance of social cohesion and loss of productive assets;
- When the Contractors need to carry out activities around the houses and farmland, preference should be given to the use of manual working means;
- The locations for the installation of construction sites and warehouses along the road should be selected carefully, and whenever possible, in fields already open to avoid over compensation and destruction of the natural environment. The selected sites must be approved by the Developer;
- National legal instruments must be followed and reinforced by WB safeguards to ensure proper compensation and resettlement process.

7.3.12. Disturbance of people and vehicle circulation during works

The construction works will increase the traffic of heavy vehicles and equipment locally. This will disturb the patterns of access and circulation, involving traffic diversion and the difficulty of access, with the potential to create traffic congestion.

The transportation of goods or products to the markets could be negatively impacted during the **construction phase**. Inadequate planning of activities can affect the normal traffic, creating congestion and cause an increase in fuel consumption and the delivery time of the products.

Except in peak season for marketing of certain products (e.g. fish and other agricultural products), transportation of goods and products is only by means of some open vehicles. Thus, the project impacts during the construction phase and demobilization will be negligible on the current agricultural and fishing chain.

Mitigation Measures

- Report traffic restrictions, where this is provided for;
- Install adequate signage in work areas, indicating alternative routes, speed restrictions and detours on the road while the works are taking place;
- Hire and train operators of traffic lights to guide drivers and pedestrians in high-traffic areas;
- Build a safe passage over the ditches that will be opened to minimize the inconvenience to the local population.

7.4. Occupational Health and Safety

There is a potential for accidents during road construction and maintenance activities. Safety is not only an issue for the community but also for the workers. The first relates to the danger that the activities can cause to local communities and drivers on the road. In the latter case, it refers to unsafe practices among road workers.

The risks associated with occupational health and safety are: (1) consumption of improper water; (2) injuries or fatalities due to cargo handling; (3) falls, slips and trips; (4) falls from height; (5) loss and projecting objects; (6) injuries and fatalities due to moving machinery and vehicles; (7) health issues related to the emission of gases and dust; (8) exposure to chemical,

hazardous and flammable substances; (9) electric shock; (10) health issues related to exposure to noise.

To communities, the following are highlighted: (1) accidents and injury to people in the community; (2) exposure to noise and vibration; (3) exposure to gases and dust.

7.4.1. Consumption of improper water

Dirty and unclean water not complying with health requirements can result in diseases for workers, ending in fatality. Since the work will be carried out in locations without access to drinking water, there is a risk of contamination from unsafe water consumption during construction. Depending on the location of areas of work such as construction sites, quarries, pits, this risk can be great.

Mitigation Measures

- The drinking water to be provided by the Contractor must comply with the recommendations and national and applicable WHO guidelines.
- Water should be stored in a cool, shady place.

7.4.2. Injuries and deaths due to manual handling of cargo

Incorrect manual handling of loads during construction can result in diseases and musculoskeletal injuries in different parts of the body (back, neck, shoulders, arms, hands, etc.). These include sprains and strains, muscle injuries, joints and blood vessels. Other injuries include cuts, bruises, lacerations and fractures.

Mitigation Measures

- The Management Plan for Health and Safety shall include procedures to avoid repetitive movements and incorrect manual handling of loads.;
- Use load-lifting equipment;
- Arrange the manual handling tasks safely, dividing into smaller loads;
- Provide information and training to workers in the tasks, the use of equipment and the correct techniques for handling loads;
- The manual work should be performed by workers who have physical conditions to carry out tasks without bringing risks to their health;
- They must be implemented and organized with enough breaks to ensure that there is a rest, especially in conditions of too much heat. Arrangements of breaks should be communicated to all the workers concerned;
- Proven and appropriate Personal Protective Equipment (PPE) must be provided to each employee at no cost at all;
- The employers must ensure that their employees carry out their activities in good physical and environmental conditions;
- The employers must provide first aid in case of any accident or illness.

7.4.3. Falls and Slipups

During the construction phase there is the risk of falls by tripping and slipping. The incorrect cleaning and storage can be the cause of accidents such as tripping over loose objects on the floor, stairs and platforms, slipping on wet or oily surfaces, shock against poorly stacked materials and out of place. This can cause mild to serious injuries.

Mitigation Measures

- The Health and Safety Management Plan should include procedures to avoid slips and falls and ensure the maintenance of local works.
- Good practice for cleaning and storage include:

    - Covering the cables and ropes on the ground and crossing paths to prevent falls (and damage to own power cables);
    - Remove the obstacles from paths/walkways;
    - Remove sweeping or scrubbing material that remains on the ground;
    - Keep the work areas and walkways well-lit;
    - Making the rugs and carpets safer (hold the ground, create grip, etc.);
    - Close the file cabinets and drawers.

- Work instructions should be implemented to avoid the presence of garbage debris, construction materials and liquid spillage outside the areas designated for them;
- Signs must be placed to warn against potential risk of falling, even if it is temporary;
- All employees must be vigilant to situations that cause distress and always communicate with the supervisors;
- Provide appropriate PPE (e.g. boots);
- The employers must ensure that their employees carry out their activities in good physical and environmental conditions;
- The employers must provide first aid in case of any accident or illness.

7.4.4. Falls from height

Some work at height as at the bridge sites can endanger workers during the construction phase and demobilization. Falling from high level associated with working on ladders and scaffolding work or on the edges or near excavations (ex. sandpits) are significant sources of permanent disabling injuries and fatalities.

Mitigation Measures

- Scaffolding and ladders

    - should be inspected by a competent person before being used. So they can be used on level ground and must be in good condition - no damage or missing parts - that may affect the safety of the ladder or scaffolding;
    - the scaffolding can be erected by competent persons;
    - the Before using a ladder or scaffolding, the appointed employees should be familiar with the risks and the results of evaluations;

- Trenching and excavation

    - There must be protection against the workers falling into the ditch;
    - The Trenches should be shaped to allow workers to get out in case of a fall (eg have a slope.);

- Use fall prevention devices

    - The safety belts and lanyards with rod limiter to allow access to the areas with the danger of falling;

- Fall protection devices such as safety harness used in conjunction with shock absorbing lanyards tied to a fixed anchor point or horizontal lines-of-life;

- Installation of bodyguard bars, including security footers on the edge of any fall hazard area;
- Proper training in the use, maintenance and integrity of the required PPE;
- Inclusion of rescue plans and/or recovery, and equipment to respond workers after a fall.
- The employers must ensure that their employees carry out their activities in good physical and environmental conditions;
- The employers must provide first aid in case of any accident or illness.

7.4.5. Flying objects

Construction and demolition activities can bring significant hazards related to the potential fall of materials and tools. Being struck by an object can cause both minor injuries such as minor cuts, and serious injuries such as amputation, blindness or death.

Mitigation Measures

- Building materials must be protected against falls if they are to be used at high levels. Appropriate measures depend on the height of the work being performed and should include:

  - Use of network security, security platforms or awnings to retain or divert an object from falling;
  - Use of safety footers, screens, or bodyguard in scaffolding bars to prevent objects from falling.

- The health and safety team must provide information to workers on the risk of being struck by objects, during health and safety meetings;
- Power tools should only be used by trained and competent workers;
- PPE must be used (especially eye protection and helmets);
- Whenever working at heights, this area should be barricaded, and safety signs should be erected indicating how hazardous the area is;
- The runners should be marked to avoid the walking and/or working under moving/suspended loads.
- The employer must ensure that their employees carry out their activities in good physical and environmental conditions;
- The employers must provide first aid in case of any accident or illness.

7.4.6. Injuries and deaths due to the circulation of machinery or vehicles

The circulation of vehicles and machinery on the construction site may pose temporary hazards such as physical contact, spillage, dust, gas emissions and noise. As a result, the following may occur: (a) people being hit by vehicles; (B) overturning of an industrial vehicle; (C) vehicle rollover (B) one drop of the industrial vehicle.

Mitigation Measures

- Establish a traffic plan for the construction site: prioritization (right of way), speed limits, car inspection requirements, standards and operating procedures (e.g.

forklifts always with forks down.) And control standards and directions of traffic in and around the construction site;

- Ensure that all drivers and visitors are reported to the administration of the work before entering the construction site;
- Ensure the segregation of vehicles and pedestrians (provide a physical barrier to make this segregation where possible);
- Ensure segregation of vehicles and pedestrians (provide a physical barrier to make this segregation where possible);
- Installation of speed humps and warning signs. These signs should be implemented to warn about the possible risks of moving machinery;
- There should be traffic aids and operations available to help drivers and operators as needed;
- Construction vehicles shall have audible warning devices (e.g. trucks to give rear movement sound.) Headlights and flashing lights (to increase the visibility of vehicles);
- Clearly demarcate areas of restricted access to the public and other workers;
- The circulation of private vehicles and delivery vehicles should be restricted to those areas and defined routes; giving preference to one-way roads, where appropriate;
- Planning by the architects and construction managers to reduce the risk of vehicle accidents;
- The industrial vehicle operators should be trained and qualified in the safe operation of specialized vehicles, such as forklifts, bulldozers, compaction rollers, scrapers, etc.
- The employer must ensure that their employees carry out their activities in good physical and environmental conditions;
- The employers must provide first aid in case of any accident or illness.

7.4.7. Dust emission

The sources of dust during the construction phase include the movement of vehicles and machinery, operations in sandpits and quarries and earthmoving works and earthworks. Inhalation of dust may cause irritation, discomfort and possible respiratory diseases to workers.

Mitigation Measures

- Where it is not possible to prevent, control methods should be initiated such as:
    - The use of wet suspension (dirty tracks and the land exposed through excavations should be kept wet on regular basis to prevent dust formation);
    - Use of vacuum cleaners instead of brooms;

- PPE use can be vital, but it should be the last resource for protection. The PPE should not replace the control of dust and should only be used where dust control methods are not effective or are inadequate.

7.4.8. Exposure to chemicals, hazardous and inflammable objects

Chemicals such as fuels, oils, lubricants, asphalt and others used during construction can pose risk of illness or injury, whether for single acute exposure or by repeated chronic exposure, particularly where the chemical has a corrosive, toxic or oxidizing property.

They also carry a risk of uncontrolled reactions, including the risk of fire and explosion, if incompatible chemicals are inadvertently mixed.

Mitigation Measures

- The fuel tanks are at lower practicable volume. Spillages should be prevented and if they occur, be removed immediately.
- Fuel storage areas must be protected from damage and collision by vehicles;
- Enclosed spaces should be provided with adequate ventilation;
- Emergency numbers should be available and made public;
- Workers should be trained and qualified to handle chemicals and hazardous materials or flammable products;
- Workers should be instructed to follow the emergency risk plan, particularly for cases of contamination and fire hazard;
- Provide fire extinguishers and instruct workers on how to use them.

7.4.9. Electrical shocks

Incorrect handling or poor maintenance of power tools, cables and wires can be sources of electrical shock. Also, non or improper insulation of wires and cables can cause electric shock, resulting in a fatality.

The severity of shock damage depends on the current voltage, amount of current, the body's resistance to electric shock and the time that the body was in contact with the current. The combination of these factors can have consequences ranging from a slight tingling to instant death.

Mitigation Measures

- Power tools must be inspected regularly (for frayed or exposed wires) to ensure they are in safe conditions of use;
- All energized electrical devices must be marked with warning signs for danger;
- Cables and extensions must be protected from damage in traffic areas by covering them or suspending them;
- The identification of "electrical hazard" in the control rooms with high-voltage equipment or in places where entry is prohibited or controlled should be fixed;
- Before starting any excavation-work there is a need to carry out detailed identification and indication of all buried electrical wiring.

7.4.10. Potential impacts related to Noise and Vibrations

During construction, noise levels along the corridor will be higher due to the use of heavy equipment standing still or moving. Table 7-2 presents the maximum noise levels recommended by the World Health Organization (WHO).

Table 7-2: Maximum noise levels recommended by the WHO in specific environments

Environment	Health implications	Leq [dB(A)][a]	Exposure time (hours)	Lmax (dB)[b]
Living area outdoors	Severe irritation, day and night	55	16	-
	Mild irritation, day and night	50	16	-
House, indoor	Speech intelligibility, moderate irritation, day and night	35	16	
Inside the room	Sleep disturbance, night	30	8	45
Outside the room	Sleep disturbance, window open	45	8	60
Classroom, indoor	Speech intelligibility, disturbance to retain information	35	During classes	-
Kindergarten, indoor	Sleep disturbance	30	Resting time	45
School, playground	Irritation	55	Playing time	-
Hospital, ward rooms, indoor	Sleep disturbance, night	30	8	40
	Sleep disturbance, night and day	30	16	-
Hospital, treatment rooms, indoor	Interference with rest and recovery	[c]		
Industrial areas, commercial, traffic, indoor and outdoor	Hearing deficiency	70	24	110
Ceremonies, festivals and entertainment events	Hearing deficiency (< 5 times/year)	100	4	110
Public areas, indoor and outdoor	Hearing deficiency	85	1	110
Music by earphones	Hearing deficiency	85	1	110
Sound impact by toys, fireworks and guns	Hearing deficiency (adults)	-	-	140[d]
	Hearing deficiency (children)	-	-	120[d]
External parks and conservation areas	Uneasiness	[e]		

Source: http://www.who.int/docstore/peh/noise/guidelines2.html

Legend:

a. Leq is the average or constant sound level during a period having the same energy.
b. Lmax is the maximum noise level that is measured over a period.
c. The lowest possible
d. Measured at 100mm from the ear

External quiet areas should be preserved and the introduction of noise in natural environments should be kept low.

As shown in Table 7-3, below, the construction equipment used in road rehabilitation often exceed the WHO recommended levels for receptors at 15m distance. Because of the relative proximity of the houses along the neighborhoods, and the fact that traffic will be maintained during construction, it is expected that people along these neighborhoods will be subject to noise levels above the maximum set by the WHO. **The impact of noise can and will be mitigated by the Contractor, but it will remain significant even after mitigation**.

Table 7-3: Level of noise caused by construction equipment before and after mitigation measures

Construction equipment			Noise level at 15m (dBA)	
			With no noise control	With no noise control
Equipment powered by an internal combustion engine	Excavation	Frontal shovels excavators	79	75
		Back excavators	85	75
		Bulldozers	80	75
		Tractors	80	75
		Scrapers	88	80
		Graders	85	75
		Trucks	91	75
		Pavers	89	80
	Material handling equipment	Mixers	85	75
		Concrete pumps	82	75
		Cranes	83	
	Stationary	Pumps	76	75
		Generators	78	75
		Compressors	81	75
Impact Equipment		Pneumatic keys	86	80
		Jackhammers	88	75
		Forklifts	101	95
Other		Vibrator	76	75
		Saws	78	75
		Asphalt plants	81	

Source: EPA, U.S. Environmental Protection Agency, 1971, Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances

The vibrations are important and are they influenced by the distance between the road and the houses, the conditions of the pavement and the type of vehicle. During construction the use of heavy equipment and soil compaction that may cause vibrations, is expected. The risk is relatively minor if these activities are conducted within the required time and during the day.

During the operating phase, the main source of noise will be cars in circulation. The noise source of a moving vehicle is mainly generated by the engine and the friction between tire and asphalt. Factors such as speed, number and type of vehicles, topography and obstacles between the transmitter and the receiver of noise influence the impact of noise on the receiver.

Improved road conditions will allow for high tonnage trucks to circulate, to transport products between S. Tomé and Neves, for 24 h. The crossing of trucks along the villages can cause vibrations and thereby disturbing people's sleep.

During the decommissioning of the camp sites, there may be noise for people who live near the sites. The Contractors may consider placing the camps at distant from the inhabited areas. Thus, it is expected that the impacts of the project on the production of noise during the demobilization will be insignificant if the camps are installed far away from villages and sensitive areas.

Workers' exposure to high noise levels can result in injuries, accidents and fatalities. Noise exposure's short-term effects include headaches, nervousness and inability to concentrate. It may be years before the damage become apparent.

Hearing loss induced by noise is usually gradual, but it can also be caused immediately by a sudden loud noise. Hearing loss is irreversible.

Mitigation Measures

- Select less noisy equipment;
- Install mufflers on some equipment, when possible;
- Install noise barriers, particularly in crossing areas of high population density such as schools, churches, places of worship, etc. Barriers should be located closer to the source or receiver to be more effective;
- Limit the hours of work for certain mobile machinery, particularly in urban areas;
- Place sources of noise at less sensitive areas to take advantage of distance and natural barriers;
- Locate road construction areas (concrete plants, Asphalt plants, quarries, etc.) and distant construction site communities whenever possible;
- Use the topography as an advantage to naturally reduce the effect of noise during the construction of construction sites;
- Develop mechanism to register and respond to claims;
- Be alert to effects on health, education and training of employees to avoid generating unnecessary noise;
- Schedule the noisiest jobs to times where fewer workers are present;
- Surveillance of the places where noise exposure is significant;
- Reducing the level of noise to a minimum. Noise levels should be kept below 80 dB (A) whenever possible;
- Concentrating all activities to the daytime hours will decrease the incidence of noise effects;
- No construction activity should be performed when the noise exceeds 45 dB (A) during the night (22:00 to 7:00) near residential, institutional or educational areas;
- Vehicles and equipment should be inspected regularly to ensure their proper operation and minimize noise emission;
- Avoid working on heavy windy days, in order to control the incidence of this impact;
- If possible, reduce the impact of noise at source through devices such as noise mufflers to be fitted to the equipment;
- Provide hearing protection gear for all staff who will work directly with the noise generation machines, including their short stay in areas where noise is excessive;
- The Transportation of materials must be done within the loading and speed limits. On unpaved roads the speed should be limited to 20 km/h.

7.4.11. Increased incidence of sexually transmitted diseases, including HIV/AIDS

There is a potential for increased incidence of sexually transmitted diseases (STDs) and HIV/AIDS due to the project. During construction and maintenance, it relates to the possibility of local workers and outsiders who due to greater affordability having the power of attracting more women (both local and sex workers) to have sex. For workers outside the added fact is that they are working for some time away from their families. In addition, there is chance to attract or encourage sex workers to the project site. During operation, particularly because it is an important corridor, there is the possibility of an increase of sexually transmitted diseases because of helpers and drivers of trucks that are often associated with irresponsible sexual behavior. This risk is great. Awareness should continue mainly in busy areas.

Mitigation Measures

- Conduct awareness campaigns for workers on STDs and HIV/AIDS and how these are transmitted, including risk behaviors;
- Conduct or recruit a specialized organization to provide awareness services to community workers on prevention of STDs and HIV/AIDS. Special attention should be given to workers, local women and girls;
- Provide free condoms in the project area;
- Encourage workers and the community to do the HIV test in the existing health facilities;
- Encourage employees to submit to the treatment of STDs and HIV in early infection/diagnosis;
- Principles established in the law of protection of workers with HIV/AIDS must be followed, which include but are not limited to:
    - Employee who is infected with HIV in the workplace, as part of their professional occupation, in addition to compensation they are also entitled to, adequate medical care aimed at easing their state of health, according to the Labor Law and other applicable legislation, funded by the Employer;
    - HIV testing to workers, job seekers to assess them during their application, job maintenance or for promotion purposes is prohibited;
    - All testing is voluntary and should have worker's consent;
    - The developer/contractor must train and guide all workers to carry out their tasks even if they are infected with HIVAIDS;
    - The developer/contractor must raise awareness among workers to prevent, and to know their status on HIVAIDS and disseminate information about the disease and on how to prevent it.

7.4.12. Risk of Malaria infection

Despite the considerable progress made in reducing its incidence Malaria remains a serious health problem in STP. Therefore, preventive measures should be taken to prevent infection to workers and the community around the project.

Mitigation Measures

- focus should be given to preventing the occurrence of the vector (mosquito), i.e., the appearance of standing bodies of water and/or its increase (in number and surface area) which serves as a mosquito breeding site;
- Periodic Reduction of mosquitoes by spraying the dorms and the construction site in general;
- All construction sites should be kept clean to avoid formation of mosquito breeding areas.

7.4.13. Road accidents

During construction, there will be movement of vehicles and machinery with great intensity to and from sandpits, quarries, construction sites and especially along the stretches to be rehabilitated. The transport of materials and movements during earth moving increases the risk of road accidents both for workers and for the communities and animals.

The deviations will be required during the construction in some sections, but in general traffic will flow with some restrictions. These deviations are ideally kept in the road reserve. In sections where it is not possible, traffic will be diverted temporarily. The vehicles in such conditional situation as the deviations, increase the risk of road accidents.

Currently the road is unsafe for transporting in open box vans, for most pedestrians, cyclists and motorcyclists. In the operating phase, the improvement of the road conditions will allow people to be transported in the safest possible conditions, i.e., on buses or mini-buses instead of open vans. Additionally, the project provides an appropriate signaling including speed bumps, traffic signs.

On the other hand, improvement of road's mobility will encourage drivers to drive at a higher speed than which is possible with the current road condition and posing a risk for pedestrians, cyclists, bikers and pets.

Mitigation Measures

- Provide safety instructions to operators for vehicles and machinery in all aspects of the project operation, to prevent accidents and minimize injuries to employees and the public. Work instructions should include:
    - Training and capacity building of the drivers and machinery operators;
    - Training for drivers and machinery operators to improve their skills, if necessary;
    - Adoption of time limits for journeys and planning schedules and layovers for drivers to avoid fatigue.

- Provide adequate temporary signs and traffic controllers along the construction sections to prevent accidents and reduce traffic congestion;
- Ensure appropriate signage in all crossings to settlements and migration routes of animals (speed bumps, rumble strips, road signs, road markings) and to give alert on hazardous conditions;
- Do regular maintenance of vehicles and the use of original manufacturer parts to minimize potential accidents that can be caused by failures and malfunctions of equipment;
- Collaborate with local communities in education on road safety, particularly along the schools or other pedestrian concentration sites particularly those with children;
- Coordinate with the emergency team to ensure that in the event of an accident, first aid is always made available;
- Find the dormitories and other facilities next to the construction site and arrange transportation of workers, to minimize the external traffic;
- Restricted Access Areas to the public should be implemented and clearly demarcated.

The Contractors shall provide signaling and possibly regulate traffic in the deviations.

7.4.14. Risk of destruction of historical-cultural resources

Particularly during construction and especially along the coastal shoreline of the City of S. Tomé to be subject to protection measures, but also on that which extends through EN1, and as presented in Chapter 4, there are a series of assets of historical and cultural value for STP that could also be recognized as having value across borders. Coastal stabilization and protection actions are not directed at the monuments themselves and where there is an intersection between the actions that will be carried out and these assets all necessary precautions must be taken. And on the coastal shoreline as well as along the EN1 in general it may happen that unknown assets are found. This also requires that the appropriate procedures contained in this ESMF should be reflected in the ESIA/ESMP and subsequent actions.

Mitigation Measures

- Avoid interfering with any asset of historical cultural value
- Any intervention that has direct relations with objects of historical-cultural value must have the approval of the authorities of historical-cultural patrimony of STP
- Demarcation and protection (e.g. fence) of the area/object
- If something of historical-cultural value is accidentally found:

    - Immediately stop all activities in the area and surrounding areas;
    - Ensure controlled access and security to/of the area/object to prevent damage, theft or any other disturbance, until the competent authorities take charge and control of the situation;
    - Notify local and/or national competent authorities within a maximum of 24 hours after the finding;
    - Notify and inform all workers of the protective measures in force;
    - In case of objects/findings are collected, prepare an inventory and deliver it to the competent authorities;
    - From the moment of the finding, record all actions or events and report to the appropriate authorities.

7.5. Environmental and Social Management Plan (PGAS)

The preliminary identified and measured impacts whose management and mitigation forms have also been preliminarily outlined will be subject to a more detailed evaluation in the ESIA and the ESMP will develop the more detailed management measures. The ESMP will be guided by the following objectives:

- Provide the entity that oversees the environmental area (now MRNEA), a tool to facilitate the environmental monitoring of all project activities considering STP environmental legislation;
- Provide clear guidance to the Developer/Contractors (their employees, service providers and others) regarding national legal requirements and international standards for sustainable environmental and social management;
- Incorporate environmental and social management into the Contractor's operational procedures;
- Serve as a plan of action for environmental and social management;
- Provide a framework for the implementation of measures to mitigate adverse environmental and social impacts;
- Prepare and maintain environmental and social performance records of project activities.

More details on the Environmental and Social Management Plan (ESMP) are presented in Chapter 9, while Annex 5 presents an ESMP model for similar interventions.

8. GUIDELINES FOR PROJECT PREPARATION, INSTRUCTION, APPROVAL AND MONITORING

The project has been classified as Category B, according to the WB regulations. In STP Decree 37/99 does not refer to Categorizing. It merely states that after the pre-evaluation it is determined whether a project requires environmental impact assessment or not. In the specific case of TPC, a decision has already been taken in STP to proceed with the ESIA and preparation of the ESMP, whose preliminary stage has already been completed. The detailed studies as such are currently taking place (i.e. June/July 2018).

In line with WB policies Category B projects require less stringent procedures of ESIA/ESMP because the environmental and social impacts are easier to deal with, with few if any of them having irreversible effects; and in most cases, the appropriate mitigation measures can be easily designed. As is the case for any intervention the best environmental and social practices recommend that the negative impacts be avoided and/or minimized, and that appropriate mitigation and implementable management measures be put in place sufficiently in advance, where prevention is not feasible.

One of the key elements to environmental and social management is the environmental and social impact assessment, which may or may not result in the development of a complete document of ESIA/ESMP, autonomous ESMP or no action needed to be taken. The environmental and social licensing process must follow the Safeguard Policy OP 4.01 on Environmental Assessment of the World Bank and the São Tomean Regulation for Environmental (and Social) Impact Assessment (Decree 37/99). The ESIA processes carried out until the formulation of this ESMF and its RPF will have to be revisited as soon as these instruments are approved and made available.

Under normal circumstances the environmental licensing process involves:

- determining the project category in line with the environmental and social impacts to be expected from it;
- determining the appropriate mitigation measures to address adverse impacts;
- incorporating mitigation measures in project development plans;
- facilitating the review and approval of proposals for construction/rehabilitation and operation;
- providing guidelines for the monitoring of environmental and social parameters for the implementation and operation of the project activities;
- ensuring the final environmental and social impact assessment of the project.

Below (Table 8-1), the critical aspects to be adopted to avoid/minimize negative impacts and to mitigate and manage them properly are suggested.

The presentation is preceded by a summary table showing the roles and responsibilities of different agencies in dealing with the various issues foreseen in this chapter.

Table 8-1: Roles and responsibilities in the licensing and implementation of environmental management measures

N.º	Action	Main responsibility	Comments
1	Preliminary assessment	Environmental and Social Safeguards Specialist (ESSS) from AFAP/INAE/Hired Consultants	step already completed. It will need to be revisited to be in line with this ESMF and accompanying RPF
2	Determination of the type of environmental and social impact assessment necessary for environmental licensing	General Directorate for Environment - DGA	it has been determined that the project requires the preparation of an ESIA/ESMP
3	Preparation of ESIA/ESMP	Hired Consultants/Service Providers under the supervision of AFAP/INAE ESSS	Consultation and public engagement involving local authorities and other interested and involved parties under preparation
4	Submission of ESIA/ESMP the DGA for review and approval	AFAP/INAE ESSS supported by the Hired Consultants/Service Providers	
5	Review and approval of the ESIA/ESMP and issuance of the environmental license	DGA	WB
6	ESMP implementation	Hired Consultants/Service Providers/Contractors supervised by Hired Supervisors and AFAP/INAE ESSS	Following the clauses specified in the ESMP and drawn up from this ESMF and its RPF
7	Follow-up/monitoring and management of complaints	ESSS-AFAP/INAE and local authorities	Local authorities should play a prominent role at this stage
8	Audit and evaluation	MRNEA/DGA, AFAP	WB

8.1. Preliminary Assessment of Activities and Project Sites

Depending on the size, nature and environmental consequences perceived from a project the São Tomean regulation for ESIA (Decree 37/99) indicates whether a project should or should not prepare an environmental impact study.

Although the process is at an advanced stage, the Preliminary Environmental and Social Assessment Form (Annex 2), which is not a requirement in the model Sao Tome and thus is offered as annex as a way of assisting the best way of defining questions to be contained in the preliminary assessment. The same can be adjusted and/or replaced by others that are more adjusted to the reality of the country. The form will be filled by AFAP/INAE Environmental Social Safeguards and Health personnel. When properly completed the form will facilitate:

- identification of potential environmental and social impacts and the identification of risks to health and safety;
- determination of the meaning of environmental and social issues;

- facilitate the determination of whether an environmental and social study is needed or not and in the case of the WB guidelines to facilitate the assignment of the appropriate environmental category.

Reportedly, this step has been internally covered by the work between the Bank and the Sao Tome authorities but for the sake of consistency and transparency it is recommended that the categorization process or determination of the licensing type required for the project follow the Normal path recommended for any other project. Therefore, after making sure that the initial documents submitted by the Consulting Team/AFAP/INAE, the preliminary assessment or determination of the project category as well as the declaration of the need for an ESIA and the ESMF must be formally issued by the General Directorate of Environment (DGA) for the due effects and to continue the process of environmental and social impact study of the project, based on the formal DGA statements.

The MRNEA structure (General Directorate of Environment) responsible will have to confirm the appropriate preliminary assessment process to comply with environmental legislation in Sao Tome.

In addition to the review of the preliminary assessment document, confirmation is usually made based on a field verification, based on the Preliminary Environmental and Social Assessment Report prepared by the Safeguards Team from the Project implementing entity (or Hired Consultants). The review will be made by MRNEA/DGA staff. Later, the same staff will inspect and supervise the preparation and implementation of the necessary measures, which will also need to be endorsed by the Bank.

8.2. Conducting Environmental and Social Work

After reviewing the information provided in the Preliminary Environmental and Social Assessment Report and having determined the appropriate environmental and social category (rules of WB) and/or if an environmental and social assessment is necessary or not (STP rules), the appropriate environmental authorities (DGA) dealing with this project, in close collaboration with the AFAP/INAE's project management team will determine as it has already been done that the project should prepare:

a) an Environmental and Social Impact Assessment
b) an Environmental and Social Management Plan.

This has already been done following the WB policies as a way of counteracting the small discrepancies between the Sao Tome and WB regulations in this field of determining the type of environmental and social impact assessment that should be followed the pre-assessment. The rules of the WB have prevailed. The support staff to environmental and social management hired by AFAP will ensure compliance with this aspect and ensure that this is done and harmonized with São Tome guidelines.

8.3. Environmental and Social Impacts Assessment (ESIA)

The ESIA will identify and assess the potential environmental and social impacts of the proposed activities under the project, evaluate alternatives, as well as the design and implementation of appropriate mitigation measures, management measures and monitoring. These measures will be captured in the Environmental and Social Management Plan (ESMP), which will be prepared as part of the ESIA document. This will be done by the Hired Consultant in line with this ESMF.

Environmental and Social Expert(s) of the Project Implementation Unit (AFAP/INAE), in close cooperation with the appropriate environmental authorities to handle this project and on behalf of the District or Municipal Authorities, shall provide for: (i) the preparation of ESIA/ESMP; (ii) the recruitment of a consultant to carry out the ESIA/ESMP (this has also been done); (iii) public consultation and participation; and (iv) review and approval of the ESIA/ESMP following the national ESIA approval process and the WB principles, where relevant.

8.4. Review and Project Approval

The General Directorate of Environment (DGA) through its Department of Environmental Assessment will receive the environmental and social assessment, environmental and social management plan documents and shall review and eventually approve them if they meet the requirements to be approved or be subject to improvements and other changes that may be necessary until a satisfactory version is produced and approved. The ESIA/ESMP documents will only be approved by the DGA after their final drafts having been submitted to the public consultation process. The final documents also need to be sent to the World Bank for approval and disclosure.

8.5. Public Consultation and Disclosure Participative

Local people and communities as well as their representatives need to be continuously involved in the decision-making related to the diversity of Project interventions. The numerous pieces of STP legislation on rights and duties of the citizenry, environmental and social management (e.g. line e) of Decree 37/99[11]), land issues, etc. place public consultation and participation at the top of the agenda. The project will ensure that the provisions of these normative documents are strictly adhered to. People/local communities and their representatives, NGOs and other stakeholders are properly placed to look after the needs of local stakeholders and promote the management capacity of local resources.

The formulation of this ESMF and accompanying RPF initiated the process of participation and involvement of the public based on the meeting of June 22, 2018, which publicly presented the project and its environmental and social safeguards instruments. This should be continued appropriately in subsequent phases, as also highlighted at that meeting.

The public participation process (PPP) is an intrinsic component of the ESIA/ESMP process with the following main objectives:

- Keep Project Interested and Affected Parties (PI&APs) informed about key issues and findings of each stage of the ESIA;
- Gather concerns and interests expressed by various project stakeholders;
- Obtain contributions/opinions of stakeholders in terms of avoiding/minimizing possible negative impacts and maximizing positive impacts of the project.
- Finally, support the social dialogue and identify from the onset, stakeholders' perceptions and expectations, which can contribute to the action planning and effective communication to minimize the impacts of the project. The process also allows for rethinking the project's technical aspects.

For the PPP to be effective, there are guidelines and procedures to be followed.

[11] Which states that the ESIA also aims to "engage and listen to the public and interested communities, including non-governmental organizations, companies and other natural or legal entities, in the assessment of the country's development projects and policies".

The process of ESIA/ESMP emphasizes the clear need for interaction and communication between the public, the parties affected by the proposed project, local NGOs, stakeholders and external organizations involved, as well as scientists and design engineers.

Each aspect of technical investigations usually includes a data collection and verification phase, followed by analysis and evaluation, and finally summary and conclusions. The results of each stage are appropriately communicated to external parties.

In terms of ESIA Regulations in force in São Tomé and Principe (Decree 37/99 and related regulatory instruments) mandatory public consultation meetings mark the end of each major phase, for example, a public consultation to discuss the draft of the final ESIA/ESMP document. Best practices recommend that public meetings should be announced in advance (e.g. at least 15 days prior to the meeting) although the Sao Tome legislation is silent as to this detail.

In addition to being invited by public notices, several participants to these meetings should be directly invited by invitation letters prepared by the Consultant and AFAP/INAE Environmental and Social personnel, issued and distributed by the project developers (AFAP/INAE). In this case, AFAP and INAE will be at the forefront in ensuring that relevant stakeholders are invited and participate in the meetings.

During the meetings, the ESIA team in collaboration with AFAP/INAE, representatives of the developers and engineering team, keep I&APs informed about the main issues and results of each stage and collect the concerns and interests expressed by several project participants. Public meetings are non-technical in nature and must be managed in a way that people from all walks of life understand what is at stake.

Where relevant, more than one public meeting can be organized. The objective is to cover as many people and entities as possible. These can also be involved separately, e.g. focus group meetings to ensure that groups, for example, women, youth, members of vulnerable groups are reached in depth. Often members of these groups feel intimidated to participate and/or express their opinions in large meetings. This also serves to recommend the choice of public venues familiar to all groups of people (e.g. schools, community centers, etc.) instead of luxury hotels or similar places that can intimidate and discourage the humblest people from participating.

It is fundamental that the Project does not contribute in any way to create land conflicts and/or exacerbate any such conflicts. Projects, such as this, have as objective to create jobs, construct infrastructure and introduce modern technologies, but if not planned and conducted properly they can also contribute to increase the number of landless people, make local food insecurity worse, cause environmental damages, stimulate rural-urban migration, etc., which are project outcomes to be avoided.

In compliance with both the GDST regulation and World Bank guidelines, before a project is approved, the applicable documents (ESIA, ESMP and even this ESMF and the RPF) must be made available for public review at places easily accessible to beneficiary communities (e.g. at a local government office, at the MRNEA/MIFAP/AFAP/INAE), and in a form, manner and language that can be easily understood, including the non-technical summaries of the main documents. They must also be forwarded to the World Bank for approval and disclosure at the Public Information in S Tome and at the World Bank Infoshop in Washington DC. Especially as part of ESIA/ESMP public consultation and participation processes, STP guidelines also have similar pre-requisites, which should be strictly followed under the Project.

8.6. Grievance and Redress Mechanism

Conflicts or complaints may arise from existing situations, particularly those involving financial losses. Conflicts often arise from poor communication, inadequate or lack of consultation, inadequate flow of accurate information, or restrictions that may be imposed on people through the implementation of project activities without adequate information/education and/or following unclear processes.

8.6.1. Prevention Measures

To prevent the exacerbation of conflicts, outreach activities will be implemented throughout the project cycle, to reduce misunderstandings and resentments. Although temporary, rehabilitation and coastal protection actions may bring disputes over job opportunities and/or working conditions around project works, and the subsequent formulation of a participatory action plan will identify potential conflicts and involve potentially affected people. Consultations and negotiations will be conducted with PAPs where there are indications of potential conflicts. The establishment of technical teams, co-management committees and local leaders in conflict management will also help minimize the negative impact of conflict. To empower communities, they will be involved in awareness raising and training on their rights and obligations, including on how to get advice and legal representation, and how to seek redress against what they see as unfair practices by developers or other entities.

8.6.2. Response Mechanisms to Complaints and Conflict

Grievance redress mechanisms should involve the local community influential leaders in providing a first level of listening and informal resolution. These leaders should be represented or involved in the co-management committees and working groups and be involved in creating awareness that they may also be used for the transmission of grievances to these *fora* for informal resolution. Some land and resource-use related conflicts may be resolved by traditional leaders. If they are beyond their scope they may be passed on to the local community court where it exists.

If issues are concerned with relationships with secondary or external stakeholders, and/or are outside the capacity of the community or local authorities to resolve, they should be presented to the co-management committees for transmission upwards to district level. If the issues are not resolved at these levels, they should be transmitted through the local authorities to the District Government for redress or mediation.

In the case of grievances, decisions on redress and communication of these to the complainant should be timely at all levels. This will promote greater trust in the communication system and improve attitudes about the Project within the community. Information should normally be returned to the community using the same channels as those used for its initial transmission. The results should be communicated to all other levels and relevant structures at the same time for coordination and awareness purposes. If the community member/group who lodged the complaint is not satisfied with the decision of the Project Authority, then as an ultimate recourse he/she/they may submit it to the court system.

In cases where conflicts or complaints are directed against governmental agencies, project management or private investors, whenever possible, Project affected people and communities will be encouraged to resolve conflicts harmoniously through informal mediation by external agencies, such as NGOs or government officers. When disputes cannot be resolved informally, more formal mechanisms will be required. Where one or more communities conflict with a private-sector entity (e.g. Contractor), the issue will be taken to the Ministry or agency with titular responsibility for the investment, i.e. MRNEA, in this case.

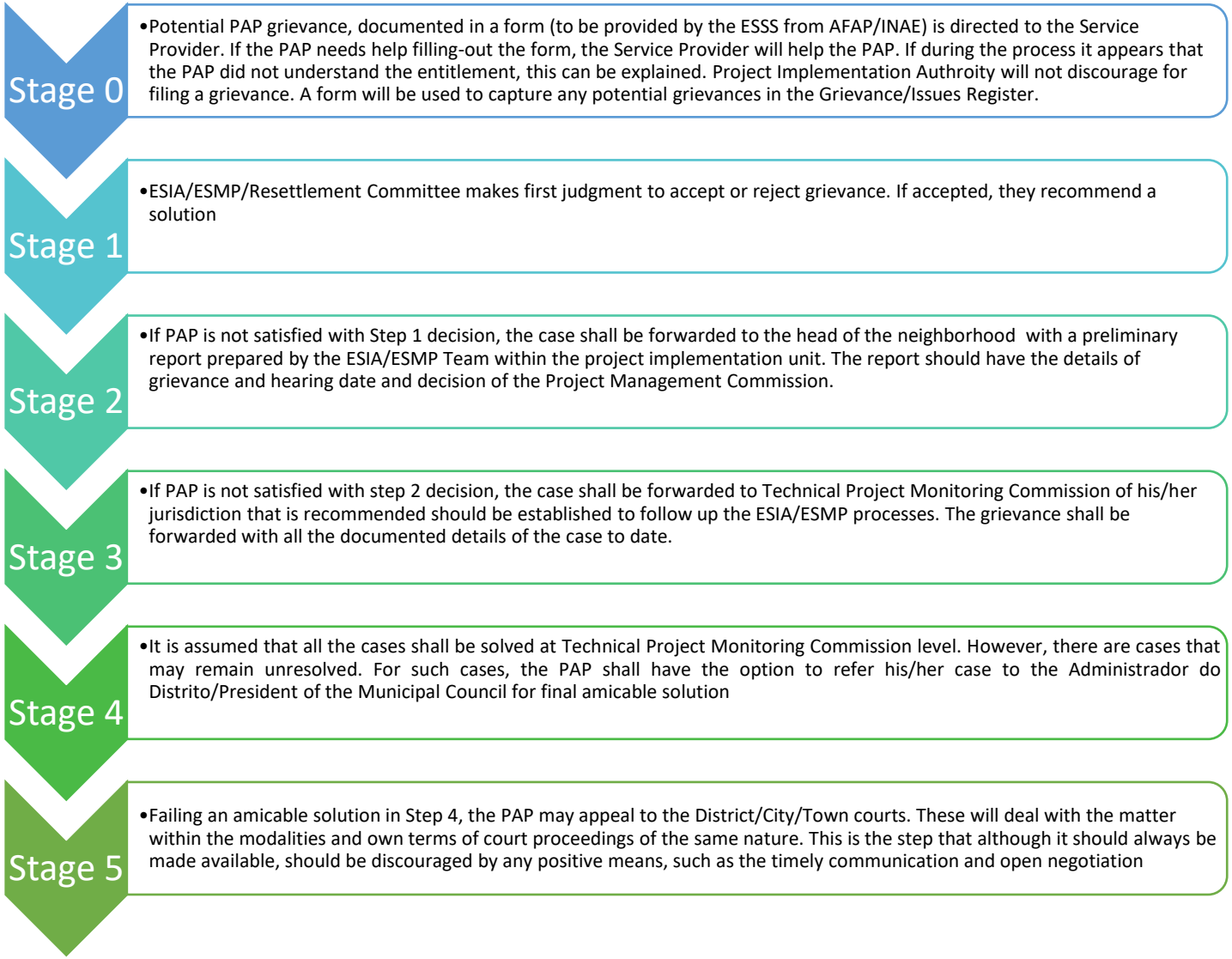
The general rule is that all grievances related with non-fulfilment of contracts, levels of compensation, seizure of assets or certain restrictions of access to resources without compensation should be brought to the attention of relevant officers and dealt with.

Communication should be done in relevant languages mainly (for verbal communication, mainly, written material will be only in Portuguese). General grievance forms to be used should be prepared by Project Implementation Unit/Environmental and Social Safeguards Personnel/Teams and made known and available to all potential users, although people should also feel free to use their own grievance documents at wish.

At the grassroots level, mainly bairro and neighborhood the country does not have unified structures to manage common matters affecting those who live there. Depending on the specific cases, these should be chosen to organize and represent the households throughout project implementation and particularly during the presentation and redressing of grievances. They should by themselves and/or assisted by other people be able to carry out all the secretarial work involved in the process, such as preparing/writing the grievances where needed, collecting them, filing, sending, translating, etc. Where affected people/households/entities want to handle the whole process by themselves they should be allowed to do so. Representation may be the best approach, but it should not be imposed.

The RPF offers more details about the steps to be followed in grievance and redress. Where these aspects are present and relevant to this ESMF they must be adopted and are summarized as follows:

Diagram 8-1: Stages to deal with grievances and redress



Stage 0:

Potential PAP claim documented on the appropriate form to be delivered by Project Implementation Units/Environmental and Social Safeguards personnel/teams; if during the process it appears that the PAP did not get it right, this can be explained. The Project Implementing Entity should not discourage filing a complaint. The complaint will include the Complaint Registration/Project Issues.

Stage 1:

Depending on the nature and characteristics of the subject in question, the Staff/teams of the Project Implementation Units/Environmental and Social Safeguards make an initial assessment to decide whether to accept or reject a claim. If accepted, the Committee recommends a final solution.

Stage 2:

If the aggrieved person is not satisfied with the decision made in Step 1, he/she can refer the case to the district authority with a preliminary report prepared by the Project Implementing Entity. The report shall contain the details of the complaint, the day of the complaint and the decision taken by the joint management committee of the project.

Stage 3:

If the PAP continues dissatisfied with the decision made after Step 2, he/she can take the case to the ESMP/RAP Monitoring Committee and Technical Supervision of his/her jurisdiction (district, town, county, etc.). The complaint will be forwarded with all the details documented on the case to the defined date.

Stage 4

It is assumed that all cases will be resolved at the level of the Advisory Council of the District/Municipal Council. However, there are cases that may remain unresolved. For such cases, the PAP will have the option to forward his/her case to the District Administrator/President of the Municipal Council for friendly end solution.

Stage 5

Failing an amicable solution in Step 4, the PAP may appeal to the District/City/Town courts. These will deal with the matter their own terms of court proceedings for issues of the same nature. This is the step which although it should always be made available, should be discouraged by all positive means, such as the timely communication and open negotiation that are part of the project's communication strategy. The institutional mechanism and the principles of consultation and community participation that are intrinsic to the processes of environmental and social management are intended to allow the process to detect and resolve problems in a timely and satisfactory manner for all parties involved.

Each step should be limited to a maximum of 15 days/two weeks from the receipt of a complaint to the decision-making.

It is strongly recommended that all necessary measures to ensure that solutions are adopted by consensus based on negotiation and agreement be taken.

Detailed procedures for compliance with the complaints and the appeal filing process should be disseminated among the PAP, which should be trained to use them when so deemed necessary. The empowerment process described in previous chapters should focus on these procedures, among other things. The procedures should be disseminated during all stages of the ESIA, ESMP and RAP.

8.7. Monitoring Reports and Annual Review

Monitoring of compliance of project implementation with the mitigation measures set out in ESMF and ESIA/ESMP will be done in close collaboration with the communities, environmental and social experts of the management team, the local representatives of MRNEA and the service provider in the environmental and social area, responsible for project execution.

The district and municipal authorities must oversee the monitoring activities and are required to annually report on the activities of the project during the previous year. The information to be included in these annual reports to capture the experience with the implementation of ESMF procedures will be included in an annex to be prepared as part of the annual report, which will be used as a guide.

Compliance monitoring includes inspection activities in place to verify that the measures identified in the ESMF and especially ESIA/ESMP/RAP (which have more specific indicators) are being implemented. This type of monitoring is like the normal tasks of the supervisory engineer whose engagement will be through a contractual agreement to ensure that the contractor adheres to contractual obligations about environmental, social, health and safety practices during construction, as prescribed in the social and environmental clauses (SEC) included in the tender documents and contracts or as described in the contractor's ESMP.

MRNEA through the environmental impact assessment unit (or an external consultant) will be responsible for conducting the inspection of health and social and environmental safety. An annual inspection report shall be submitted (together with the accompanying report) to the Ministry of Finance and Public Administration/AFAP/INAE and the World Bank for review and approval.

Independent local consultants, local NGOs or other service providers who are not otherwise involved with the project, therefore independent, can perform annual reviews. Annual reviews should assess the annual monitoring report of the district and municipal authorities and the annual inspection report of the environmental management unit.

It should be stressed that the annual reviews are not normal in the ESIA/ESMP based on current practices in STP. The management team will need to make dedicated efforts to ensure that this work is done correctly. Training and Capacity Building will also be necessary.

8.8. Environmental and Social Audit

An independent and external environmental, social, health and safety audit will be held in the mid-term of the project implementation and at the end of the project. The auditing team must inform the Ministry of Finance and Public Administration/AFAP/INAE and the World Bank, which will deal with the implementation of all corrective measures that will be needed. Audits are necessary to ensure that: (i) ESMF process is being implemented properly, and (ii) mitigation measures in accordance with the provisions are being identified and implemented. The audit will be able to identify if any change in the ESMF approach is necessary to improve its effectiveness.

Audit reports include:

- A summary of the environmental, social, health and safety performance of the project, based on the ESIA/ESMP/RAP and implementation of environmental and social clauses in contracts and contractor's ESMP/RAP;
- The presentation of compliance and progress in the implementation of the project ESMP/RAP;
- A summary of the results of environmental and social monitoring of individual project control measures (as set out in the project ESMP/RAP).

The main tasks of the audit are:

- Consider the project description;
- Indicate the objective, scope and criteria of the audit;
- Verify the level of compliance by the developer with the conditions of the ESMP/RAP, Environmental and Social Clauses and Contractor ESMP/RAP;
- Evaluate the developer's knowledge and awareness of and responsibility for the application of relevant legislation;
- Review existing project documentation related to all infrastructure facilities and designs;
- Examine monitoring programs, parameters and procedures in place for control and corrective actions in case of emergencies;
- Examine records of incidents and accidents and the likelihood of future occurrence of the incidents and accidents;
- Inspect all buildings, premises and yards in which manufacturing, testing and transportation takes place inside and outside the project area, as well as areas where goods are stored and disposed of and give a record of all significant environmental, social, health and safety risks associated with such activities;
- Examine and seek views on health and safety issues from the project employees, the local and other potentially affected communities; and
- Prepare a list of health and safety and environmental and social concerns of past and on-going activities.

9. GUIDELINES FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING REQUIREMENTS

9.1. Environmental and Social Management Plan (ESMP)

A site specific ESMP must be prepared as part of the ESIA process, according to the guidelines of the World Bank. This, as already stated, is not said specifically in the Environmental Impact Assessment Process Regulation (RPAIA) in STP, which foresees the preparation of the ESMP as part of the ESIA with the view to monitor the main identified environmental impacts and the proposed mitigation measures although it does not specifically refer to it. An ESMP should include "monitoring of impacts, prevention plans and accident contingencies".

In an ESMP, various mitigation measures are organized into a well-formulated plan to guide the planning, design, construction and operation of the planned interventions. Under the ESIA/ESMP process and particularly under this ESMF, what is described below should be viewed as dynamic, which may require updating or revision during the implementation of the activities.

An effective ESMP will be a practical document, which will precisely set out both the goals and actions required in mitigation as well as indicators for follow up/monitoring.

The ESMP covers a set of measures that need to be taken to ensure that impacts are dealt with in the following hierarchical order[12]:

- **Avoidance**: avoiding activities that could result in adverse impacts. Avoiding resources or areas considered as sensitive;
- **Prevention**: preventing the occurrence of negative environmental and social impacts and/or preventing such an occurrence from having negative environmental and social impacts;
- **Preservation**: preventing any future actions that might adversely affect an environmental and social resource. Typically achieved by extending legal protection to selected resources beyond the immediate needs of the project;
- **Minimization**: limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, redesigning elements of the project;
- **Rehabilitation**: repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation;
- **Restoration**: restoring affected resources to an earlier (and possibly more stable and productive) state, typically 'background/pristine' condition;
- **Compensation**: creation, enhancement or protection of the same type of resource at another suitable and acceptable location, compensating for lost resources.

The management measures set forth in the ESMPs and the Environmental and Social Clauses (ESCs) will be included in the bidding documents and in the various contractual clauses for the design, construction and appropriate operation of the interventions to be adopted. All construction contracts should comply with the Environmental and Social Clauses and if relevant with the ESMP and Contactor ESMP prepared for the project. Their implementation

[12] Ref: The World Bank. Environment Department. January 1999. Environmental Management Plans. Environmental Sourcebook Update. Number 25

is the responsibility of the Contractors. The Supervising Engineers will be required to monitor the adequate implementation of these clauses. Contractors will be required to prepare and implement their own Contractor ESMP and should employ an experienced environmental, health and safety specialist for this purpose. The Supervising Engineers will be required, by contractual arrangement, to supervise the adequate implementation of the Contractor ESMP.

A series of steps to be followed to ensure that the planning, rehabilitation/construction and operation within the Project follow best practices will also include an annex on Guidelines for Good Practice in Road Construction and Operation - Health and Safety Guidelines (Annex 4), which should be followed creatively.

10. REQUIREMENTS FOR TRAINING AND CAPACITY BUILDING

The successful implementation of the project depends, inter alia, on the effective implementation of the environmental and social management measures outlined in the ESIA/ESMP and in the RAP, as recommended under the RPF that complements this document. Education and training will be needed for key stakeholders to ensure that they have the knowledge and the right skills to implement the environmental and social management plan and the resettlement action plan.

10.1. Assessment and Analysis of Institutional Capacity

The descriptions given in Chapter 5 clearly show that there has been considerable progress in the institutional, legal and regulatory processes related to environmental and social management in S. Tome and Principe. However, coordination and law enforcement remain a serious challenge. Practical knowledge and related routines also need to be formed and consolidated.

The Ministry of Infrastructure, Natural Resources and Environment (MRNEA) is entrusted to "promote sustainable development through practical leadership and implementation of environmental policy of the country". However, the subject of the environment and sustainable management remains a new subject for which practical arrangements on how to do things on a day-to-day basis are still being developed.

This can be illustrated by the fact that the preparation of environmental and social impact studies in STP has been scarce for the number of years that Regulation 37/99 has lasted. Anecdotal information suggests that in the whole country not more than 20-30 such studies have been prepared over the past 16-17 years. This could also be in line with the reduced investments in projects considered as having significant environmental and social impacts, nonetheless also a sign that the country does not yet have a routine in that area. This may affect the practical implementation of the provisions made in this ESMF and the RPF.

The various institutions, development strategies, laws and regulations are not necessarily harmonized to ensure that they reach the common objectives within the sector. Human and material investments are needed to translate the various provisions into concrete actions. This is further compounded by the fact that a substantial part of the country's inhabitants is active in the informal sector, which makes it very difficult to regulate them.

To cope with the diverse and complex issues related to communication, coordination, capacity building and institutional strengthening a qualified Environmental and Social Safeguards Specialists (ESSS) has been established at AFAP. This Specialist needs to work closely with INAE and DGA, who are the owners' engineers of the EN1 and Coastal Protection projects. He also needs to get his influence across the districts and municipalities involved as well as other stakeholders, including private contractors. Most certainly the Environmental and Social Safeguards area needs to be strengthened within the scope of this project although this may be temporary to provide it with more and capable people in INAE and DGA and even in the districts and municipalities covered by the project. Dedicated and temporary Technical Assistance also needs to be considered.

There should be synergies between this project and others that the STP government has (for example the Central Africa Backbone (CAB) Submarine Cable Extension Project between the African coast and Europe (ACE), Contador Energy Rehabilitation Project, Climate Change Adaptation Project for the Coastal Areas (PAMCZC), etc.) to share experiences and lessons learned, including the sharing of resources.

10.2. Proposed Program Training and Awareness

The general objective of the training and awareness programs for implementation of the ESIAs/ESMP/PAR is to:

- sensitize the various stakeholders on the linkages between environment and social impacts of the project;
- demonstrate the role of the various key players in the implementation and monitoring of the safeguards instruments (ESMF-ESIA/ESMP/PAR);
- sensitize representatives and leaders of community groups and associations (who will in turn convey the message to their respective communities) on the implementation and management of the mitigation measures; and on their roles in achieving environmental and social sustainability;
- ensure that people at the local level can provide leadership and guidance as well as supervise the implementation of their components in the ESIA/ESMP/RAP, etc.;
- ensure that participants can analyze the potential environmental and social impacts, and competently prescribe mitigation options as well as supervise the implementation of management plans;
- strengthen local NGOs and relevant local personnel to provide technical support.

The stakeholders have different training needs for awareness raising, sensitization, and comprehensive training, namely:

- awareness-raising for participants who need to appreciate the significance or relevance of environmental and social issues, that go even beyond just safeguards (i.e. gender mainstreaming, social accountability and/or grievance redress mechanism, etc.);
- sensitization for participants who need to be familiar with the ESIA/ESMP/RAP, and to monitor respective implementation; and
- Comprehensive training for participants who will need to understand the potential adverse environmental and social impacts and who will at times supervise implementation of mitigation measures and report to relevant authorities.

Practical ways of reaching all target groups will need to be devised for training and capacity needs assessments as well as for delivery of the training. The “Learning by Doing” approach in relative detriment of studies and other forms of advice and assistance/delivery will be given priority consideration. The training of trainers is also seen as a relevant approach as it will assist in the creation of basic conditions for sustainability and replication of the interventions. The outcomes of such a process will live beyond the life span of the Project and have repercussions in other projects and areas and translate into national gains with a wider outreach.

10.3. Technical Assistance (TA)

In addition to other forms of technical assistance provided to the project efforts should be made to ensure that where and when needed TA is available to address specific issues related to the proper implementation of the ESMF and RPF requirements. In due course, the need for

short, medium and long term technical assistance needs to be evaluated in more detail and the way forward outlined. The results will be used to develop the best approach for the implementation of TA for the project. On an intermittent basis, at AFAP there should be a specific position of TA in the form of a consultant supported by Bank funds; such a person must have jurisdiction to interpret, analyze and implement the ESMF/RPF requirements and to help in developing and implementing a training program.

11. REQUIREMENTS OF ESMF MONITORING

Monitoring will be fundamental to ensure that the objectives set forth in the ESMF and RPF as well as in the ESIA/ESMP and RAP are being achieved satisfactorily and where there are nonconformities to, timely, introduce changes. This will be a continuous process and will include compliance and outcome monitoring. The aim is to verify key concerns on compliance with the ESMF/RPF, implementation progress and extent of effective consultation and participation of local communities and other relevant entities.

Project Implementation Unit (PIU), especially the environmental and social management officials will have the overall responsibility for coordinating and monitoring the implementation of the ESMF/RPF. They will have to conduct sensitization programs to inform stakeholders about the frameworks, how they work and what will be expected of them. They will undertake continuous compliance monitoring and evaluation to ensure that:

- All project activities are implemented according to the environmental and social management requirements of this ESMF/RPF and the specific Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP) to be formulated;
- Problems arising during implementation are being addressed early enough to avoid any spill-over that could subsequently hinder the outcomes of the project (i.e. issues of Grievance Redress Mechanism); and
- Environmental and social mitigation or enhancement measures, designed as per this ESMF/RPF or additional environmental and social mitigation measures identified during project implementation and/or ESIA/ESMP/RAP preparation, are reflected within specific ESMP/RAP and monitoring plans.

The Project Implementation Unit (PIU) will consult and coordinate with the appropriate government agencies on environmental and social monitoring. Quarterly progress reports will be prepared and circulated to all relevant entities covering aspects such as:

- Implementation schedule;
- Extent of community involvement;
- Allocation of funds;
- Problems arising as well as solutions devised, during implementation;
- Efficiency of contractors in fulfilling their environmental, social, health and safety management contractual obligations; and
- Efficiency of Supervising Engineers in fulfilling their environmental, social, health and safety monitoring contractual obligations.

For major project activities, the Project will procure external independent consultants/firms to:

i. conduct the monitoring and evaluation of the project activities, and
ii. verify the effectiveness of measures for mitigation of negative impacts and enhancement of positive impacts. The Independent Consultant/Firm will develop a detailed monitoring and evaluation plan (including questionnaires and inventory forms) from terms of reference, based on the ESMP/RAP submitted to and approved by the GSTP and the WB/IDA.

12. COSTS AND BUDGET ESTIMATE

The project will be make resources available, among other things, to finance the implementation of the environmental and social safeguards including training, preparation of ESIA/ESMP and RAP and monitoring/evaluation and auditing the implementation of these instruments, as well as impact assessment in many areas of project activities.

Based on the structure and content of the Project and on what is known about the receiving natural and social environment the impacts are expected to be localized and of reduced magnitude, while at the same time being of short duration. the need to resettle people should be avoided and/or be brought to a minimum.

More specifically, the funds will also cover the costs of hiring facilitators for the implementation and monitoring of various environmental and social management measures. All compensation and mitigation measures including the payment of cash compensation and the issuance of environmental licenses after completion of studies and preparation of the ESIA, PGAS and RAP will be under the responsibility of the GSTP.

The initial budget lines and the estimate of the fixed amount needed to cover this component of the Project are calculated on the basis of the percentage of the amounts allocated to each of the main areas of intervention with ESIA/ESMP and RAP implications, namely: (i) **Rehabilitation of the EN1 Road S. Tomé-Guadalupe-Neves: Civil Works and Project Supervision (xxx $ millions)**[13]; and (ii) **Rehabilitation of the Marginal Road and Coastal Protection, including Supervision of Civil Works (xxx $ million**)[14]. The two components together make up **xxxx $ millions**[15].

An initial 1.5% cost share of these two components was adopted to cover this component. This is a slightly higher proportion than the one established for the Contador Project (1%) for environmental and social safeguards, which was a simpler project. In general, between 1 and 5% is acceptable and common for this type of projects. In due course, adjustments may be made as to the amount to be mobilized for distribution by the different budget lines to be covered. At the outset it is estimated that the dissemination, training/training around the requirements of the ESMF will mobilize a considerable portion of the funds. This will be followed by ensuring that the formulation, monitoring and evaluation of implementation are consistently done in line with this guiding document. Below are the items to be considered for the implementation of the ESMF, as well as for the preparation, implementation, monitoring and evaluation of the ESMP.

Table 12-1: Estimated budget for ESMF implementation

Item	Total Amount US$ 1,000.00
ESMF Implementation	
Project start-up and preparation for implementation	
Recruitment and mobilization of service providers to the ESMF	
General technical assistance	
Specific technical assistance	
Monitoring	
Supervision	

[13] amount to be determined
[14] amount to be determined
[15] amount to be determined

Item	Total Amount US$ 1,000.00
Annual review	
Education and Training	
At the central level	
The district/municipal level	
Other technical professionals at the grassroots level	
NGOs, CBOs, Community Associations	
Preparation and implementation of ESIA/ESMP	
Preparation and implementation of ESIA/ESMP	
Total	

The total cost of the preparation and implementation of the ESMF, and ESIA/ESMP in this document stands at **US$ xxxx (xxxx United States Dollars)[16].**

[16] amount to be determined

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ANNEXES

Annex 1: Minutes of the Public Meeting in S. Tomé (22 June 2018)

Transport Sector Development and Coastal Protection Project

P161842

Preparation of the Environmental and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF)

Public Meeting with the Project Stakeholders

Minutes of the Meeting

São Tomé, 22 June 2018

Annexes

Annex 1: List of Entities Directly Invited to the Meeting

Annex 2: List of Participants

Annex 3: Consultant's Presentation

Annex 4: Images from the Meeting

Annex 2: Model of Environmental and Social Screening Form for Projects

Nr of order: ……	Date of filling

This ESSF form is designed to assist in the environmental and social screening of the Project to be executed in the field on-site.
Project Location:……
Project Leaders:……

Part A: Brief description of the project
……

Part B: Identification of environmental and social impacts

Environmental and social concerns	Yes	No	Remarks
Sector resources			
Will the project require large volumes of construction materials from the local natural resources (sand, gravel, laterite, water, wood construction, etc.)?			
Does it require vast clearing or acquisition of land areas?			
Biodiversity			
Will the project cause impacts on endemic, rare, vulnerable species (i.e. IUCN Red List species) and or important economic, ecological, physical cultural resources and components			
Are there any areas of environmental or ecological sensitivity that could be adversely affected by the project? E.g., forests, wetlands (lakes, rivers, seasonal floodplains, critical habitats, other natural habitats), etc.			
Protected areas			
Does the project area (or its components) have impact on protected areas (national parks, national reserves, protected forests, a World Heritage Site, etc.?)			
If the project is outside protected areas, but at a short distance from protected areas, could it adversely affect the ecology within the protected area? (e.g. interference with the flight of birds, migration of mammals)			
Geology and Soils			
From the geological or soil point of view are there unstable areas (erosion, landslide, collapse)?			
Are there any areas at risk of soil salinization?			
Landscape/aesthetics			
Will the project have any adverse effect on the aesthetic value of the landscape?			
Historical, archaeological or cultural sites			
Has the project the potential to change one or several historic, archaeological, cultural sites, or require excavations?			
Loss of assets and other			
Does the project trigger the temporary or permanent loss of natural or built assets, including crops, agricultural land, grazing, fruit trees, houses and domestic infrastructure, business and business opportunities?			
Pollution			
Is the project likely to cause high levels of noise?			
Has the project the potential to generate significant amounts of solid and liquid wastes? (i.e. waste oils, high BOD effluents, heavy metals, other toxic chemicals, pesticides, fertilizer pollution, etc.)			
If "yes" has the project client prepared a plan for waste collection and disposal or management?			
Is there Environmental and Social Management Capacity and Equipment?			

Environmental and social concerns	Yes	No	Remarks
Is there any risk that project could affect the quality of surface water, groundwater, drinking water sources			
Has the project any potential of affecting the atmosphere and causing air pollution (dust, PM10, various gases such NOx, SO2, etc.)			
Lifestyle			
Does the project have any potential of causing alterations in the lifestyle of local people?			
Could the project lead to the accentuation of social inequalities?			
Does the project have the potential to lead to incompatible uses of resources or to social conflicts between different users or is there a risk that local communities could lose the access to their land or lose the use rights of their land?			
Health and Safety			
Does the project have the potential to lead to risks of accident for workers and communities?			
Does the project have the potential to cause risks to the health of workers and the communities? (i.e. HIV/Aids)			
Does the project have the potential to lead to an increase in the population of disease vectors? Malaria, Intestinal and Urinary Bilharzia and others			
Local Incomes			
Does the project create temporary or permanent jobs?			
Does the project promote the increase of agricultural production and/or create other income generating activities?			
Gender Concerns			
Does the project promote the integration of women and other vulnerable groups and provide them access to resources such as irrigated agriculture, markets, etc.?			
Does the project take into account the concerns of women and does it encourage their involvement in decision-making?			

Public Consultation and Participation
Have public consultation and participation been sought?
Yes____ No___
If "Yes", briefly describe the measures taken to this effect.

Part C: Mitigation
For all "Yes" given answers briefly describe the measures taken to that effect.

Part D: Project classification and environmental and social work

- No environmental and social work needed …….. ☐
- Freestanding ESMP or ESCs) …….. ☐
- ESIA with an Environmental and Social Management Plan (ESMP) ☐
- Contractor ESMP

Project classified as category:

☐ A ☐ B ☐ C

Annex 3: Environmental and Social Clauses

The environmental and social clauses presented below will be integrated (as applicable) into Contracts for the Design, Construction, Operation and Maintenance of the project.

a. Prior arrangements for carrying out works

Compliance with laws and regulations:

The Contractor and its subcontractors must: know, respect and enforce laws and regulations in force in the country regarding the environment, disposal of solid and liquid waste, air emission and effluent standards and allowed noise levels, hours of work, etc.; take all appropriate measures to minimize harm to the environment and people; take responsibility for any claims related to environmental non-compliance.

Permits and approvals before work

Any work carried out must be preceded by obtaining information about permits (e.g., environmental permit) and administrative permissions. Before starting work, the Contractor shall obtain all permits necessary for carrying out the work under the contract: authorizations are issued by local communities, forest services (in the case of deforestation, pruning, etc.), mining services (in case of quarries and borrow sites), hydraulic services (in case of use of public water points), the Labor Inspection, network managers, etc. Before starting any works, the Contractor shall consult with the residents with whom he can decide to facilitate the progress of the project implementation.

Meeting before starting works

Before starting work, the Contractor and the Project Manager, under the supervision of the Client, shall hold meetings with government officials, representatives of the population in the project area and relevant technical services to inform them about the consistency and duration of works, routes involved and locations likely to be affected. This meeting will enable the Client to collect people's suggestions, raise awareness on environmental and social issues and their relationships with the workers.

Identification of concessionaire networks

Before starting works, the Contractor shall investigate a procedure for identifying concessionaire networks (water, electricity, telephone, sewer, etc.) on a plan that will be formalized by Minutes of Meetings signed by all parties (Contractor, works supervisor, concessionaires).

Release of public and private domain

The Contractor should know the perimeter of a public utility related to the operation is the perimeter that may be affected by the works. Work can only begin in the affected areas by private companies when they are released because of an expropriation process.

Environmental and social management program

The Contractor shall prepare and submit for approval by the Project Manager a detailed project environmental and social management program including: (i) a site plan showing the location of the site and the various areas of the site for project components and locations, (ii) a site plan for waste management indicating the types of waste, the type of collection considered, the storage, the method and location of disposal; (iii) the information and awareness program specifying targets, themes and selected consultation modality; (iv) a plan for accident management and health protection stating the risks of major accidents which endanger the health or safety of staff and/or public security measures and/or health protection to be applied in the context of an emergency plan. The Contractor shall also prepare and submit, for approval by the prime contractor, a plan to protect the environment of the site, which includes all security measures to protect the site and forward a site decommissioning plan at the end of works.

The environmental and social management program will also include: the organization of staff in charge of environmental, health and safety management with an indication of the officer in charge of the Project Environmental Health and Safety Department, description of the methods to reduce negative environmental, social, health and safety impacts, the water supply and sanitation management plan, the list of agreements made with the owners and current users of private sites, etc.

b. Construction Plant and Work Camp Rules

Location standards

The Contractor shall construct temporary construction facilities to cause the least disturbance possible to the environment, preferably in areas already cleared or disturbed when such sites exist, or on sites that will be reused at a later stage for other purposes. The Contractor shall strictly prohibit the establishment of a base camp within a protected area.

Display rules and staff awareness

The Contractor shall display a clearly visible internal regulation in the various camp facilities specifically prescribing: respect for local customs, protection against STI/HIV/AIDS, hygiene rules and safety and environmental measures. The Contractor shall educate its staff regarding respect for customs and traditions of the people of the area where the works are being performed and the risks of STDs and HIV/AIDS.

Use of local labor

The Contractor shall engage (besides his technical staff) as much labor as possible from the area where the works are being performed. Failing to find qualified personnel on site, it is permitted to bring a workforce from outside the work area.

Child labor

Harmful Child Labor, which consists of the employment of children that is economically exploitative or is likely to be hazardous to or interfere with, the child's education, or to be harmful to the child's health, or physical, mental, spiritual, moral or social development should not be allowed.

Respect for working hours

The Contractor shall ensure that work schedules comply with the laws and regulations in force. Any waiver is subject to the approval of the project manager. Wherever possible (except in exceptional cases provided by the prime contractor), the Contractor shall avoid performing work during the rest hours, Sundays and holidays.

Protection of site personnel

The Contractor shall make available to site personnel prescribed working clothes and in good condition and all accessories and safety protection to their activities (helmets, boots, belts, masks, gloves, goggles, etc.). The Contractor shall ensure scrupulous use of protection equipment on site. Permanent monitoring should be carried out for this purpose and, in case of violation, enforcement actions (warning, suspension, dismissal) must be applied to personnel.

Person(s) Responsible for Health, Safety and Environment

The Contractor shall appoint Health/Safety/Environment Officer(s), who will ensure that the hygiene, safety and environmental protection rules are strictly followed by all and at all levels of performance, both for workers and the population as well as others in contact with the site. He will locate health centers closest to the site to allow its staff to have access to first aid in case of accident. The Contractor

shall prohibit access to the site by the public, protect it with tags and signs, indicate different access and take all order and security measures to avoid accidents.

Appointment of staff on duty

The Contractor shall provide care, supervision and safety maintenance of the site including an after-hours on-site presence. Throughout the construction period, the Contractor shall have personnel on call outside working hours, every day without exception (Saturday, Sunday and holidays), day and night, to take action with regard to any incident and/or accident that may occur in connection with the works.

Measures against traffic blockage

The Contractor shall avoid blocking public access. He must constantly maintain and guarantee the movement and access of residents during construction. The Contractor shall ensure that no excavation or trench is left open at night without a temporary fence and/or proper signage approved by the Project Manager. The Contractor shall ensure that temporary deviations allow for passage without danger.

c. Decommissioning of construction sites
General Rules

Upon releasing a site, the Contractor leaves the premises to their own immediate use. He cannot be released from his obligations and responsibilities without ensuring that the site is in good condition. The Contractor shall carry out all the necessary works for rehabilitation of the site and restore it to its initial or almost initial state. All equipment, materials, polluted soil, etc. will be removed and cannot be abandoned on site or surrounding area.

Once the work is completed, the Contractor shall: (i) remove temporary buildings, equipment, solid and liquid waste, leftover materials, fences, etc. (ii) rectify faults in drainage and treat all excavated areas; (iii) reforest areas initially deforested with appropriate species in relation to local forest services; (iv) protect the remaining dangerous works (well, open ditches, slopes, projections, rehabilitate quarries, etc.); (vi) install functional pavements, sidewalks, gutters, ramps and other structures essential for public service. After the removal of all equipment, a report on the rehabilitation of the site must be prepared and attached to the minutes of the reception of the works.

Protection of unstable areas

During the execution of works in unstable environments, the Contractor shall take the following precautions not to accentuate the instability of the soil: (i) avoid heavy traffic and overload in the zone of instability; (ii) retain as much as possible the vegetation or restore it using native species where there are erosion risks.

Control the execution of environmental and social clauses

The Project Manager, whose team should include an environmental expert who is part of the mission control team, shall verify compliance and the effectiveness of the implementation of the environmental and social clauses by the Contractor.

Notification

The Project Manager shall notify the Contractor of any event of default or non-performance of environmental and social measures. The Contractor shall rectify any breach of the regulations duly notified to him by the Project Manager. Costs of restarts or additional works arising from non-compliance shall be borne by the Contractor.

Sanction

Pursuant to contractual non-compliance with environmental and social clauses, duly noted by the Project Manager, may be grounds for termination of the contract. The Contractor whose contract has been terminated due to non-implementation of environmental and social clauses may be subject to sanctions up to suspension of the right to bid for a period determined by the Client, with a reduction on the price and blocking the pay back of the guarantee.

Reception of the works

Failure to follow these terms exposes the Contractor to provisional or final refusal of acceptance of the works, by the reception Commission. The implementation of each environmental and social measure may be subject to partial acceptance involving relevant departments.

Obligations under the guarantee

The obligations of the Contractor run until the final reception of the works that will happen only after the complete execution of the works to improve the environment as stated in the contract.

d. Environmental and Social Clauses
Works signage

Prior to the opening of construction sites and whenever necessary the Contractor shall place, pre-signage and signage within an appropriate distance in line with the laws and regulations in force.

Measures for the movement of construction equipment

During the works, the Contractor shall limit vehicle speeds on site by installing signs and flag bearers. In residential areas, the Contractor shall establish the schedule and route for heavy vehicles, which must circulate outside the sites to minimize nuisances (noise, dust, risk of accidents and traffic congestion) and carry approval of the project manager.

Only strictly necessary materials will be tolerated on the site. Outside access, designated crossing places and work areas, it is prohibited to operate construction equipment.

The Contractor shall ensure that the speed limit for all vehicles on public roads, will be a maximum of 60 km/h on rural roads and 40 km/h in urban areas and through villages. Drivers exceeding these limits shall be subject to disciplinary action up to and including dismissal. The installation of speed humps or water spraying in settlements will be recommended to reduce the risk of accidents and reduce the nuisance of dust.

Vehicles of the Contractor shall, always, comply with the requirements of the Highway Code in force, particularly regarding the weight of the laden vehicle.

The Contractor shall, during the dry season and depending on water availability, regularly spray water on dusty roads/tracks used by its transport equipment to avoid dust, especially in populated areas.

Protection of crossing areas and agricultural activities

The work schedule should be established in such a way as to minimize disruption of agricultural and fisheries activities. The main periods of activity must be known to adapt the construction schedule to these important socioeconomic activities. The Contractor shall identify where crossings for animals, livestock and people are needed. Again, the involvement of the population is paramount.

Protection of wetlands, fauna and flora

It is forbidden for the Contractor to establish temporary installations (storage areas and parking, or paths to circumvent works, etc.) in wetlands, including the filling of existing temporary pools. In the case of

vegetated areas, the Contractor must avoid or minimize any clearing of natural vegetation and be careful not to introduce new species without first consulting the forestry services. For all deforested areas lying outside the right-of-way and required by the Contractor for the purposes of its works, the top soil must be kept separate and restored afterwards.

Protection of sacred sites and archaeological sites

The Contractor shall take all necessary measures to respect the cultural and cultural sites (cemeteries, sacred sites, etc.) existing near the works and not interfere them with. For this purpose, he must first identify their type and location before starting the works.

If, during construction, remains of places of interest for worship, historic or archaeological value are discovered, the Contractor shall follow the following procedure: (i) stop work in the area, (ii) immediately notify the Project Manager who must take steps to protect the site to avoid destruction by defining a protection perimeter on the site within which no activity shall be carried on, and (iii) to refrain from removing and moving objects and relics. The work must be suspended within the scope of protection until the national body responsible for historic and archaeological sites has given permission to continue.

Measures for logging and deforestation

In the case of limited land clearing for project facilities, felled trees must be cut and stored in locations approved by the Project Manager. Residents should be aware of the possibility that they can make use of this timber at their convenience. Felled trees should not be left on site or burned or fled under the earth materials. Felled trees should be compensated in nature or in monetary value, depending on the existing laws.

Liquid Waste Management

The Contractor shall prevent spills and wastewater discharge, oil and all kinds of pollutants in surface water or groundwater or on soils. The Project Manager will provide treatment methods, disposal procedures, disposal sites and drainage locations to the Contractor.

Solid waste management

The Contractor shall provide an ample number of well-located waste bins for use by all construction workers and other project personnel. He shall strictly prohibit and punish any littering or unauthorized waste dumping by all employees. The Contractor shall also deposit the garbage in bins to be emptied and sealed periodically. In case of evacuation of the site by trucks, bins should be sealed to prevent the waste spillage. For hygiene reasons, and to not attract vectors daily collection is recommended, especially during hot periods. The Contractor shall dispose of or recycle the wastes in an environmentally sound manner. For this purpose, the Contractor should store waste in labeled containers. The Contractor shall deliver the waste, if possible, to existing disposal sites.

Protection against noise pollution

The Contractor shall limit construction noise in order not to disturb residents, either by excessively long duration, or by their extension outside of normal working hours. Thresholds are not to exceed 55 decibels (dB) during the day and 45 decibels at night.

Prevention against STD/HIV/AIDS and related diseases

The Contractor shall inform and educate staff on the risks of STD/HIV/AIDS. He must make sufficient and good quality condoms available to staff free of charge to be used against STDs and HIV/AIDS infections. Local communities should also be informed about the risks of STDs and HIV/Aids.

The Contractor shall inform and educate employees on safety and health at work. He must maintain the safety and health of workers and local populations and take appropriate measures for this purpose. The Contractor shall provide the following preventive measures against the health and safety risks: (i) enforce the wearing of hardhats, uniforms, boots, and other appropriate footwear and equipment; and (ii) systematically install a medical clinic at the construction site and provide free medications necessary for emergency care on site for the staff.

Site journal

The Contractor shall maintain a log yard, which will record complaints, violations, accidents or incidents that have a significant impact on the environment or impacts on the local communities. The site log is unique to the site and notes must be handwritten in ink or typed on a computer. The Contractor shall inform the general public and local residents in particular, about the existence of this journal, with an indication of where it can be accessed.

Equipment maintenance and equipment project

The Contractor shall comply with the maintenance standards for construction equipment and vehicles and conduct refueling and lubricant exchange in a place designated for this purpose. Refueling should take place on a concrete slab. Fuel tanks should be placed within a concrete bund of 110% volume the volume of the fuel tank or tanks. Oil/water separators should be installed where there is a risk of pollution with hydrocarbons, e.g., at vehicle maintenance sites. On the site, provision of absorbent materials and insulators (pillows, sheets, tubes and peat fiber, etc.) as well as sealed containers clearly identified for receiving petroleum residues and waste, must be present. The Contractor shall perform, under constant surveillance, handling of fuel, oil or other contaminants, including the transfer to avoid spillage. The Contractor shall collect, process and recycle all waste oil, and waste in operations and maintenance or repair of machinery. It is forbidden to discharge any hydrocarbons or other dangerous chemicals into the environment or on the construction site.

The Contractor shall drain the waste oils in sealed drums and retain oils to return it to the supplier (recycling). Used spare parts must be sent to the landfill or disposed of in another environmentally acceptable manner.

Washing areas and areas for maintenance of equipment and vehicles must be from concrete and equipped with a collection system for oils and fats, with a slope oriented to prevent the flow of pollutants to areas with bare soil. Concrete mixers and equipment for the transportation and installation of the concrete should be washed in the areas provided for this purpose.

Dust control

The Contractor shall select the location of crushers and similar equipment based on noise and dust they produce. Goggles and dust masks are mandatory.

Worker behavior

The Contractor shall strictly prohibit, and specify transparent penalties for, any environmentally problematic or socially inappropriate activities by construction workers or any other project personnel. Examples of activities to be prohibited include hunting, bush-meat purchase, wildlife capture, plant collection, vegetation burning, or inappropriate interactions with local people.

Only properly trained and licensed security personnel may possess firearms.

Annex 4: Environmental, Health, and Safety Guidelines for TOLL ROADS

Road EHS.pdf

Annex 5: Typical ESMP for Road Rehabilitation Projects

Generic Environmental and Social Management Plan Template for TPC Interventions

Component Title: Indicate that this is the ESMP for XXXX component (EN1 or Coastal Protection)

Purpose

The ESMP provides a set of good environmental practices that should be followed by the Contractor(s) to be hired to implement the project. It is in line with the international best practices and environmental requirements in force in STP.

The general purpose of an ESMP is to ensure that all project activities are conducted and managed in an environmentally responsible manner. Specifically, it aims to:

- Provide the entity that oversees the environmental area (currently the Ministry of Natural Resources, Energy and Environment - MRNEA), with a tool to facilitate environmental monitoring and auditing of all project activities in line with the STP and World Bank environmental and Social Policy Framework;
- Provide clear guidelines to the Developer/Supervising Engineer/Contractors (employees, service providers and others) with a tool to facilitate environmental monitoring of all project activities in line with the STP and World Bank environmental legislation;
- Provide clear guidelines to the Developer/Contractors (employees, service providers and others) with the domestic and international legal requirements of sustainable environmental and social standards;
- Incorporate environmental and social considerations in the Supervising Engineer's/Contractor's operating procedures;
- Serve as an action plan for environmental and social management and monitoring;
- Provide a framework for implementation of mitigation measures related with the environmental impacts, and
- Prepare and maintain environmental performance records of project activities.

Scope

The ESMP is applicable for the Rehabilitation/Construction of XXXXX EN1/Coastal Protection.

The ESMP is a dynamic document and subject to change and is intended to give more details to the Contractor about the environmental conditions and obligations regarding the project.

Proposed Structure of the ESMP

Title: specific for each intervention (i.e. EN1 or Coastal Protection)

1. Introduction

Context

Objectives

Importance

2. Project description

2.1. Activity identification

2.2. Location of the activity

2.3. Description of the activity

• Construction Phase

• Operation Phase

• Deactivation/Decommissioning Phase

3 Legal Framework

3.1. National

3.2. International (Bilateral, Regional, Conventions, Protocols, …)

3.3. World Bank Policy Framework

4. Legal Compliance Analysis

4.1. Socio-environmental

4.2. Institutional

4.3. Legal (National, International and World Bank Policy Framework)

4.4. Implementation

5. Diagnosis of the Social and Environmental Status

5.1. Geographical context of the project

5.2. Biophysical description (including identification of environmental issues)

5.3. Socio-economic description (including identification of socio-economic issues).

6. Identification and Assessment of Environmental and Social Impacts

6.1. Identification of Expected Impacts (biophysical, socio-economic, positive and negative)

6.2. Assessment of the Impacts (nature: positive/negative; magnitude: low/medium/high, reversibility: reversible/irreversible, and significance: insignificant/significant/very significant),

7. Environmental Management Measures

7.1. Mitigation and Enhancement Measures

7.2. Environmental Management Programmes

7.2.1. Water Resources Management Programme

7.2.2. Soil Management Programme

7.2.3. Waste Management Program

7.2.4. Air Quality Management Program

7.2.5. Risk and Emergency Management Program

7.2.6. Socio-economic Management Program

- Child Labor
- Gender Based Violence
- Labor Influx Incidence
- Conflicts in the use of natural resources

8. Training and Capacity Building

9. Implementation Structure of the ESMP

10. Conclusions and Recommendations:

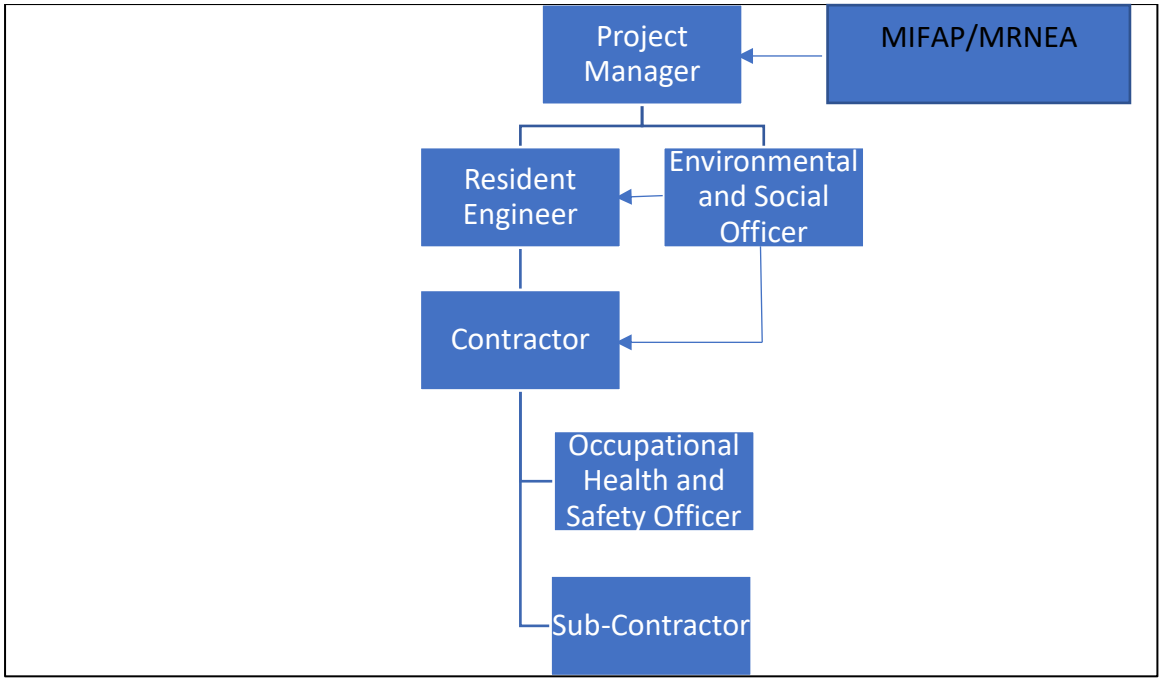
11. References

Proposed ESMP Institutional and Organizational Arrangements

Compliance with the instructions in this document is the responsibility of the Project Developer (AFAP/INAE/DGA/PIU). However, to ensure the sound development and effective implementation of the ESMP, it will be necessary to identify and define the responsibilities and authority of the various persons and organizations that will be involved in the project.

The following entities will be involved in the implementation of the present ESMP:

- Lead Authority: AFA/INAE/DGA - PIU
- Other Relevant Entities:
- Ministry of Natural Resources, Energy and Environment (MRNEA);
- Project Manager or Developer (INAE/DGA);
- Resident Engineer (RE);
- Environmental and Social Officer (ESO);
- Contractor;
- Occupational Health and Safety Officer (OSHO);
- Sub-contractors.
- **Error! Reference source not found.**Proposed management structure of the project



Roles and Responsibilities:

The Developer (AFAP/INAE/DGA - PIU) will hire a resident construction engineer (RE) and an environmental and social specialist (ESSS). The first will be responsible for overall construction and second to ensure implementation of the ESMP. The Contractor will receive instructions from the RE and will be responsible for implementation of all environmental and social specifications. The Contractor should hire an occupational, health and safety officer (OHSO) to ensure implementation of all preventive measures to the workers. Contractors should make available the terms and conditions to their sub-contractors.

The following descriptions represent the minimum level of roles and responsibilities of above actors to implement the ESMP. The roles and responsibilities described below can be updated as necessary.

N.°	Entity	Roles and responsibilities
1	**MRNEA/DGA**	• ensure the implementation of the environmental policies. • participate in meetings with the Project Developer and other stakeholders at the start of the ESMP process to reach agreement on the approach to the ESMP; • review the draft ESMP submission. Based on the review, the authority will either (i) approve the ESMP (with or without conditions), (ii) return the ESMP for further improvement and re-submission, giving guidance on what needs to be revised or added, or (ii) reject the ESMP, giving reasons; • process and issue the environmental license for construction and operation of the project; • review monitoring and audit reports, if required; • perform random controls to check compliance with the ESMP. In case of persistent non-compliance, the Project Developer will be required to provide an action plan with corrective measures and have them approved by the authorities.
2	Project Manager (PM)	Assisted by the TPC ESSS and the Project Engineer TPC Project Manager will: • take up overall responsibility for the environmental and social aspects of the project. An important part of this role will be to: o ensure that the ESMP approved by MRNEA/DGA and the Funding Agency is included in the bid documentation for selection of contractors; o audit the implementation of the ESMP by the Contractor; o report on the implementation of the ESMP to INEA/DGA senior managers, MRNEA/DGA and/or the funding agencies as and when necessary. o hire the Contractor and supervision team (resident engineer and environmental control officer); o establish and maintain regular and proactive communication with the resident engineer, contractor, etc.; o undertaking periodic site visits and site inspections to perform an environmental audit of the implementation of the project ESMP; o review and comment on environmental reports produced by the Resident Engineer, Contractor, etc.; o report to Funding Agencies (WB and other) and/or MRNEA/DGA as and when required on the state of the environmental and social for the project ESMP; o ensure that the Generic ESMP is reviewed and updated as necessary.

N.°	Entity	Roles and responsibilities
3	Resident Engineer (RE)	The PM and will be required to oversee the construction program and construction activities performed by the Contractor. Roles and responsibilities include: • review and approve method statements by the Contractor in connection with the ESMP; • oversee the general compliance of the Contractor with the ESMP and other pertinent site specifications; • liaise between and with the contractor and the PM on environmental and social matters, as well as any pertinent engineering matters where these may have environmental consequences • be familiar with the contents of the ESMP; • monitor the Contractor's compliance with the Environmental Specifications daily, through the Site Diary; • communicate to the Contractor, verbally and in writing, necessary advices to perform environmental and social management of the works; • request for, review and approve the Method Statements prepared by the Contractor; • review and approve drawings produced by the Contractor in connection with, for example, the construction site layout, access/haul roads and so on; • advise on materials that may be used to designate working areas and materials to be used for the works as and when necessary; • undertake damage assessments where incidents, accidents and serious infringements have occurred on/off site; • review and approve all areas that have been rehabilitated by the Contractor; • review complaints received and make instructions as necessary; • accompany PM Team during site inspections and/or inform it in writing of any infringements of the Environmental Specifications and to issue instructions to the Contractor; • discuss with the PM Team the application of penalties for the infringement of the Environmental Specifications, and other possible enforcement measures when necessary; • issue or motivate for penalties to be issued as and when necessary; • implement Temporary Work Stoppages where serious environmental infringements and non-compliances have occurred; • maintain a record of complaints from the public and communicate these to the Contractor and the PM; • facilitate proactive communication between all role-players in the interests of effective environmental and social.

N.°	Entity	Roles and responsibilities
4	Environmental and Social Specialist (ESS) At central and provincial levels Environmental and Social Officers (ESO) can also be hired on temporary basis for more complex subprojects	The ESS will be required to liaise with the PM on the level of compliance with the ESMF and RPF including specific ESIAs, **ESMP** and RAP achieved by the Contractor on a regular basis for the duration of the contract. This will be a full-time position to deal with the overall project and specific ESMPs to: • advise the RE on the interpretation and enforcement of the Environmental Specifications, including discussions on non-compliances; • supply environmental information as and when required; • review and approve Method Statements produced by the Contractor with the RE; • demarcate particularly sensitive areas and pass instructions through the RE concerning works in these areas; • monitor any basic physical changes to the environment because of the construction works – e.g. evidence of erosion, dust generation and silt loading in runoff; • undertake regular inspections and submit reports on the Contractor's compliance with the Environmental Specifications. These reports shall be copied to the RE and to the PM; • undertake quarterly audits of the construction works and submit audit reports to the PM for review; • communicate frequently and openly with the Contractor and the RE to ensure effective, proactive environmental and social, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts; • undertake damage assessments with the RE where incidents, accidents and serious infringements have occurred on/off site; • advise the RE on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities; • review and approve all areas that have been rehabilitated by the Contractor; • review complaints received and make instructions as necessary; • identify and make recommendations for minor amendments to the ESMP as and when appropriate; • maintain the material for the Environmental Training Awareness courses and Environmental Information Posters as part of the overall environmental training for the contract; • ensure that the Contractor, his employees and/or Sub-Consultants receive the appropriate environmental awareness training prior to commencing and during activities; • establish and maintain an Environmental Site Diary to record all environmental incidents related to the construction of the Project.

5	Contractors and Subcontractors	The PM will appoint a Contractor to undertake the construction of the given project. The Contractor' will be contractually required to undertake his/her activities in an environmentally responsible manner, as described in the ESMP. Roles and responsibilities include: • be familiar with the contents of the ESMP; • implement, manage and maintain the ESMP for the duration of the contract; • designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the ESMP; • assign appropriate authority, accountability and responsibility for these personnel to carry out their duties; • provide appropriate resources, budgets, equipment, personnel and training – for the effective control and management of the environmental risks associated with the construction. • comply with the Environmental Specifications contained in the ESMP and subsequent revisions; • confirm legislative requirements for the construction works, and ensure that appropriate permissions and permits have been obtained before commencing activities; • ensure that access to the land for the construction site and works has been acquired; • prepare Method Statements, program of activities and drawings/plans for submission to the RE; • undertake daily site inspections (with the RE) to monitor environmental performance and conformance with the Environmental Specifications; • review the site inspection reports and take cognizance of the information/recommendations contained therein; • notify the RE, verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken; • ensure environmental and social awareness among his employees, sub-contractors and workforce so that they are fully aware of, and understand the Environmental Specifications and the need for them; • maintain a register of environmental training for site staff and sub-contractor's staff for the duration of the contract; • undertake rehabilitation of all areas affected by construction activities to restore them to their original states, as determined by the RE; • undertake the required works within the designated working areas;

N.°	Entity	Roles and responsibilities
6	Occupational Health and Safety Officer (OHSO)	The Occupational Health and Safety Officer (OSHO) will be hired by the Contractor to ensure the health and safety of both workers and the community. Roles and responsibilities include: • ensure compliance with the specifications; • conduct workers' induction and regular sessions on occupational health and safety, including emergency procedures; • ensure that the material and human conditions for response to accidents at work are available and on standby.
7	Other entities	Other authorities may be involved in activities relating to the ESMP. For example, local authorities may be involved in monitoring activities. Other authorities may also be involved in the development, implementation, review and approval of the ESMP, e.g. the MOH for health, water and meteorology, tourism and transport sector, etc. The reason for their involvement is primarily to verify the accuracy and comprehensiveness of the information provided from the viewpoint of their specific mandates and areas of responsibility (e.g. permits, licenses and compliances).

Annex 6: Household questionnaire used for preliminary social survey and assessment

Projeto de Desenvolvimento do Sector de Transportes e Proteção Costeira

Preparação dos Instrumentos de Salvaguardas Ambientais e Sociais do Projeto

Questionário dos Agregados Familiares/Outras Unidades Socioeconómicas

NR. Do questionário		**Data**	
Inquiridor			

INSTRUÇÕES PARA O ENTREVISTADOR:

- Peça para falar com o/a chefe do agregado familiar/dono do negócio ou com a sua esposa/o seu esposo e solicite o seu consentimento para fazer a entrevista.
- O questionário deve, de preferência, ser ministrado simultaneamente ao/à chefe do agregado familiar/dono do negócio e à sua esposa/ao seu esposo. Se só um estiver disponível, fale apenas com ele (ela). Se nenhum deles estiver disponível pode-se falar com a pessoa mais sénior que estiver disponível.

INTRODUÇÃO:

Bom dia/boa tarde. O meu nome é …… e sou um entrevistador ao serviço da AFAP (Agência Fiduciária de Administração do Projeto), uma entidade do Governo de S. Tomé e Príncipe (GSTP) que Administra Fundos de Projetos de Desenvolvimento.

Neste momento a AFAP está a facilitar o processo de formulação do Projeto de Desenvolvimento do Sector de Transportes e Proteção Costeira (PDSTPC) que abrange a reabilitação cerca de 27 km da EN1 de S. Tomé a Guadalupe e Neves assim como a proteção costeira do troço da estrada de Pantufo ao Aeroporto. O projeto está ainda em fase de preparação e entre aspetos pretende-se nesta fase perceber quais poderão ser os seus impactos ambientais e sociais para se poder delinear as melhores medidas de gestão.

As suas respostas serão usadas para preparar os instrumentos de Salvaguardas Ambientais e Sociais do Projeto que estão neste momento a ser preparados. A sua participação é extremamente valiosa para o estudo e apreciaríamos se você e/ou a sua esposa gastasse (m) algum tempo connosco e nos dissesse(m) como você(s) e o seu(vosso) agregado familiar vive(m) e como se poderão relacionar com o projeto.

IDENTIFICAÇÃO DO AGREGADO FAMILIAR

Coordenadas do Agregado Familiar	E:	
	S:	
Distrito	|__|	1 – Água Grande; 2 – Lobata; 3- Lembá
Localidades	Colocar o nome da Localidade que o inquirido referir	

Nome do chefe do agregado familiar		
Nome do respondente		
Relação do respondente com o chefe do agregado familiar	|__|	1. Chefe do agregado familiar (CAF) 2. Esposa do CAF 3. Filho/filha do CAF 4. Genro/Nora do CAF 5. Pai/Mãe do CAF 6. Padrasto/Madrasta do CAF 7. Sogro/Sogra do CAF 8. Irmão/irmã do CAF 9. Avô/Avó do CAF 10. Neto/Neta do CAF 11. Sobrinho/Sobrinha do CAF 12. Adoptado/criado por/enteado do CAF 13. Outro parente do CAF (especificar) _____

A. COMPOSIÇÃO DO AGREGADO FAMILIAR

Instruções para o entrevistador:

- ***Liste todas as pessoas do agregado familiar, desde a mais velha à mais nova. Não esqueça de incluir bebés, crianças pequenas e a pessoa entrevistada.***
- ***"Membro do agregado familiar": todas as pessoas que comem ou contribuem para a mesma panela, quer presentemente vivam ou não em casa.***

#	Nome do membro do agregado familiar	A1. Relação com o chefe do agregado familiar	A2. Género	A3. Idade (anos)	A4. Estado Civil	A5. Residência	A6. Nível de educação mais elevado que completou
1		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
2		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
3		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
4		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
5		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
6		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
7		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
8		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
9		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
10		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
11		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
12		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
13		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
14		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
15		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
16		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
17		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
18		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
19		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
20		|__|__|	|__|	|__|__|	|__|	|__|	|__|__|
	A7. Número total de pessoas do agregado familiar |__|__|	1. Chefe do agregado familiar (CAF) 2. Esposa do CAF 3. Filho/filha do CAF 4. Genro/Nora do CAF 5. Pai/Mãe do CAF 6. Padrasto/Madrasta do CAF 7. Sogro/Sogra do CAF 8. Cunhado/Cunhada 9. Irmão/irmã do CAF 10. Avô/Avó do CAF 11. Neto/Neta do CAF 12. Sobrinho/Sobrinha do CAF	1. Masculino 2. Feminino	99. Não sabe	1. Solteiro 2. Casado pelo civil 3. Casado pela igreja 4. Casado tradicionalmente 5. Casado com cerimónias mistas (civil e/ou igreja e/ou tradicional) 6. Casado de facto (vivem juntos) 7. Separado/divorciado 8. Viúvo(a)	1. A viver em casa 2. Ausente a trabalhar noutro ponto do país 3. Ausente a trabalhar fora do país 4. Ausente a estudar noutro ponto do país 5. Ausente a estudar fora do país 06. Ausente temporariamente por outras razões (especificar)	1. Nenhum 2. Sabe ler e escrever o seu nome e alguns números 3. Jardim infantil/Escolinha 4. Básico I (1ª – 4ª classe) 5. Básico II (5ª – 6ª classe) 6. Secundário I (7ª – 9ªclasse) 7. Secundário II (10ª-12ªclasse) 8. Formação Profissional (10ª – 12ª classe) 9. Universitário 99. Não sabe

#	Nome do membro do agregado familiar	A1. Relação com o chefe do agregado familiar	A2. Género	A3. Idade (anos)	A4. Estado Civil	A5. Residência	A6. Nível de educação mais elevado que completou
		13. Adoptado/criado por/enteado 14. Outro parente (especificar)_____ 15. Sem parentesco com o CAF (especificar)_____					

B. OCUPAÇÃO E EMPREGO

Instruções para o entrevistador:

- *Providencie informação baseada na lista da Secção A acima, i.e. os números atribuídos aos membros do agregado familiar na primeira tabela devem permanecer os mesmos ao longo do questionário.*
- *Preencha a tabela para todos os membros do agregado.*

#	Situação de Emprego		Para os Membros Empregados	
			E1. Ocupação Principal	E2. Tipo de Empregador
1	|__|__|		|__|__|	|__|
2	|__|__|		|__|__|	|__|
3	|__|__|		|__|__|	|__|
4	|__|__|		|__|__|	|__|
5	|__|__|		|__|__|	|__|
6	|__|__|		|__|__|	|__|
7	|__|__|		|__|__|	|__|
8	|__|__|		|__|__|	|__|
9	|__|__|		|__|__|	|__|
10	|__|__|		|__|__|	|__|
11	|__|__|		|__|__|	|__|
12	|__|__|		|__|__|	|__|
13	|__|__|		|__|__|	|__|
14	|__|__|		|__|__|	|__|
15	|__|__|		|__|__|	|__|
16	|__|__|		|__|__|	|__|
17	|__|__|		|__|__|	|__|
18	|__|__|		|__|__|	|__|
19	|__|__|		|__|__|	|__|
20	|__|__|		|__|__|	|__|
21	|__|__|		|__|__|	|__|
22	|__|__|		|__|__|	|__|
23	|__|__|		|__|__|	|__|
24	|__|__|		|__|__|	|__|
25	|__|__|		|__|__|	|__|
	1. Criança (com menos de 5 anos) 2. Estudante 3. Com emprego formal (contrato formal e salário regular) 4. Com emprego informal (sem contrato nem acordo formal) 5. Trabalhador sazonal 6. Trabalho por conta própria 7. Desempregado (procurando activamente emprego) 8. Doméstico (não procurando emprego) 9. Reformado (recebe pensão) 10. Incapacitado e não empregado	Passar para F1… Passar para F1… Passar para F1… Passar para F1… Passar para F1… Passar para F1…	1.Agricultura 2. Pesca 3. Artesanato 4. Trabalho doméstico 5. Comércio (loja) 6. Comércio (barraca ou outro negócio informal) 7. Comércio ambulante ou no chão 8. Trabalhador não qualificado (sem habilidade - ex. guardador carros, cobrador) 9. Trabalhador qualificado (com habilidade, trabalha por conta própria - mecânico, electricista, carpinteiro, etc) 10. Profissional (com contrato formal - professor, enfermeiro, contabilista, etc) 98. Outra (especificar) _____	1. Governo 2. Empresa privada 3. Individual 4. Trabalho por conta própria 5. Parente (com remuneração) 6. Parente (sem remuneração)

C. PROPRIEDADE

H1. Há quanto tempo é que você e o seu agregado familiar vivem nesta casa/explora este negócio? (anos)
|__|__|

H2. Como é que adquiriu cada um dos componentes da propriedade?
Instruções para o entrevistador: escreva o código da opção correcta para cada um dos componentes da propriedade.

Componente da propriedade		Modo de aquisição
i.	Casa principal	|__|__|
ii.	Quarto (s)	|__|__|
iii.	Cozinha	|__|__|
iv.	Latrina	|__|__|
v.	Casa de banho	|__|__|
vi.	Casa para banho	|__|__|
vii.	Casa espiritual	|__|__|
viii.	Celeiro	|__|__|
ix.	Capoeira	|__|__|
x.	Pocilga	|__|__|
xi.	Curral	|__|__|
xii.	Varanda	|__|__|
xiii.	Vedação	|__|__|
xiv.	Garagem	|__|__|
xv.	Barraca/loja	|__|__|
xvi.	Outro (especificar)	|__|__|
xvii.	Outro (especificar)	|__|__|
xviii.	Outro (especificar)	|__|__|
xix.		[01] Autoconstrução [02] Compra [03] Herança [04] Recebido como donativo [05] Recebido como empréstimo [06] Paga renda [98] Outro (especificar) _____

K. ÁRVORES

Indique por favor quantas das seguintes árvores o agregado familiar possui actualmente, onde estão localizadas, a sua idade média e o seu uso:

#	K1. Tipo de árvore	K2. Número aproximado de árvores possuídas	K3. Localização da maioria das árvores	K4. Idade média	K5. Uso
1	Laranjeira	|__|__|	|__|	|__|	|__|__|
2	Limoeiro	|__|__|	|__|	|__|	|__|__|
3	Coqueiro	|__|__|	|__|	|__|	|__|__|
4	Fruteira	|__|__|	|__|	|__|	|__|__|
5	Mangueira	|__|__|	|__|	|__|	|__|__|
6	Bananeira	|__|__|	|__|	|__|	|__|__|
7	Papaieira	|__|__|	|__|	|__|	|__|__|
8	Tangerineira	|__|__|	|__|	|__|	|__|__|
9	Eucalipto	|__|__|	|__|	|__|	|__|__|
10	Cajamangueira	|__|__|	|__|	|__|	|__|__|
11	Sap-Sap	|__|__|	|__|	|__|	|__|__|
12	Abacateira	|__|__|	|__|	|__|	|__|__|
13	Jaqueira	|__|__|	|__|	|__|	|__|__|
14	Carrocero				
15	Cacaueiro				
16	Outra (especificar) _____	|__|__|	|__|	|__|	|__|__|
17	Outra (especificar) _____	|__|__|	|__|	|__|	|__|__|
18	Outra (especificar) _____	|__|__|	|__|	|__|	|__|__|
		99. Não sabe *Registe **00, se nenhuma** →Passe para a árvore seguinte e não responda de K3 a K6.*	1. Dentro do quintal da habitação 2. No campo de cultivo 3. Noutro terreno/talhão do agregado 4. Na terra de outra pessoa	1. Muda com menos de 3 anos 2. Nova 3. Adulta (pico de produção) 4. Velha	01. Consumo do agregado familiar 02. Venda 98. Outro (especificar) _____ 99. Nenhum

L. ANIMAIS

Indique por favor quantos dos seguintes animais o agregado familiar possui actualmente, o seu uso e onde se localiza o pasto:

#	L1. Tipo de animal	L2. Número aproximado de animais possuídos	I3. Principal uso do animal	I4. Pasto
1	Galinha	|__|__|	|__|__|	Passar para L5
2	Coelho	|__|__|	|__|__|	Passar para L5
3	Pato	|__|__|	|__|__|	Passar para L5
4	Pomba	|__|__|	|__|__|	Passar para L5
5	Porco	|__|__|	|__|__|	Passar para L5
6	Cabrito	|__|__|	|__|__|	|__|__|
7	Ovelha	|__|__|	|__|__|	|__|__|
8	Vaca/boi	|__|__|	|__|__|	|__|__|
9	Outro (especificar) _____	|__|__|	|__|__|	|__|__|
10	Outro (especificar) _____	|__|__|	|__|__|	|__|__|

#	L1. Tipo de animal	L2. Número aproximado de animais possuídos	I3. Principal uso do animal	I4. Pasto
	Não considere gatos ou cães	*Registe 00 se nenhum e passe para o animal seguinte. Não responda de L3 a L5.*	01. Consumo do agregado familiar 02. Venda/aluguer 03. Trabalho agrícola 04. Consumo e venda 98. Outro (especificar) _____	01. Campo/terreno do agregado familiar 02. Pasto do agregado familiar 03. Pasto/terra comunitária 98. Outro (especificar) _____

M5. Sobre a deslocação dos membros do agregado familiar:

Instrução ao entrevistador: seleccione só uma opção.

#	M6. Principal meio de transporte usado	M7. Frequência da deslocação	M8. Destino da deslocação	M9. Razão da deslocação
1	|__|__|	|__|__|	|__|__|	|__|__|
2	|__|__|	|__|__|	|__|__|	|__|__|
3	|__|__|	|__|__|	|__|__|	|__|__|
4	|__|__|	|__|__|	|__|__|	|__|__|
5	|__|__|	|__|__|	|__|__|	|__|__|
6	|__|__|	|__|__|	|__|__|	|__|__|
7	|__|__|	|__|__|	|__|__|	|__|__|
8	|__|__|	|__|__|	|__|__|	|__|__|
9	|__|__|	|__|__|	|__|__|	|__|__|
10	|__|__|	|__|__|	|__|__|	|__|__|
11	|__|__|	|__|__|	|__|__|	|__|__|
12	|__|__|	|__|__|	|__|__|	|__|__|
13	|__|__|	|__|__|	|__|__|	|__|__|
14	|__|__|	|__|__|	|__|__|	|__|__|
15	|__|__|	|__|__|	|__|__|	|__|__|
16	|__|__|	|__|__|	|__|__|	|__|__|
17	|__|__|	|__|__|	|__|__|	|__|__|
18	|__|__|	|__|__|	|__|__|	|__|__|
19	|__|__|	|__|__|	|__|__|	|__|__|
20	|__|__|	|__|__|	|__|__|	|__|__|
21	|__|__|	|__|__|	|__|__|	|__|__|
22	|__|__|	|__|__|	|__|__|	|__|__|
23	|__|__|	|__|__|	|__|__|	|__|__|
24	|__|__|	|__|__|	|__|__|	|__|__|
25	|__|__|	|__|__|	|__|__|	|__|__|
	[01]A pé [02] Bicicleta [03] Carro pessoal [04] Transporte gratuito em veículo motorizado privado [05] Transporte pago em veículo motorizado privado [06] Transporte público [98] Outro (especificar)_____	[01] Todos dias [02] Algumas vezes por semana [03] Uma vez por semana [04] 2-3 vezes por mês [05] Uma vez por mês [06] Algumas vezes por ano [07] Irregularmente (quando necessário) [98] Outro (especificar) _____	[01] Dentro do bairro [02] Outro bairro [03] Localidade [04] Distrito/sede [06] Cidade mais próxima	[01] Ir ao campo de cultivo [02] Trabalhar/pesca [03] Estudar [04] Fazer negócios [05] Comprar [06] Ir ao hospital [07] Ir à igreja [08] Visitar família/amigos [09] Passear/lazer [98] Outro (especificar) _____

S. CONHECIMENTO ACERCA DO PROJETO

S1. Já ouviu falar do projeto

[1] Sim

[2] Não

S2. Se sim como foi informado acerca do projeto

[1] Amigos/vizinhos

[2] Imprensa (rádio, televisão, jornais, revistas)

[3] Participei em reuniões de apresentação/discussão do projeto

[4] Rumores por alto

T. PERCEPÇÃO DO PROJECT0

T1. Qual é a sua opinião geral sobre o projecto de Reabilitação **da Estrada/Orla Costeira?**

Instrução para o entrevistador: seleccione só uma opção.

[1] Estou muito feliz com ele

[2] Estou feliz com ele

[3] Espero para ver

[4] Não estou feliz com ele

[5] Não estou nada feliz com ele

[9] Não tenho opinião

U. PREFERÊNCIAS DE COMPENSAÇÃO

U1. Não está confirmado que o projecto afecte alguns agregados familiares. Todavia, no caso de uma casa/construção e/ou parte (s) dela ter de ser deslocada ou deitada abaixo, o que é que prefere como compensação pela perda sofrida?

Instrução para o entrevistador: Seleccione só uma opção.

[01] Substituição por uma nova construção

[02] Materiais de construção

[03] Pagamento em dinheiro

[98] Outra (especificar) _____

U2. Se a sua terra for afectada pelo projecto, o que é que prefere como compensação pela perda?

[01] Terra de substituição

[02] Pagamento em dinheiro

[98] Outra (especificar) _____

U3. Se as suas culturas forem afectadas pelo projecto, o que é que prefere como compensação pela sua perda?

[01] Quantidade equivalente do produto esperado no fim da campanha

[02] Assistência para cultivar um local alternativo

[03] Pagamento em dinheiro

[98] Outra (especificar) _____

[99] Não tem culturas afectadas

U4. Se as suas árvores forem afectadas pelo projecto, o que é que prefere como compensação pela sua perda?

[01] Mudas de substituição
[02] Pagamento em dinheiro
[98] Outra (especificar) _____
[99] Não tem árvores afectadas

DESENHO DA CASA

COMENTÁRIOS ADICIONAIS RELEVANTES (PARA O ENTREVISTADOR)