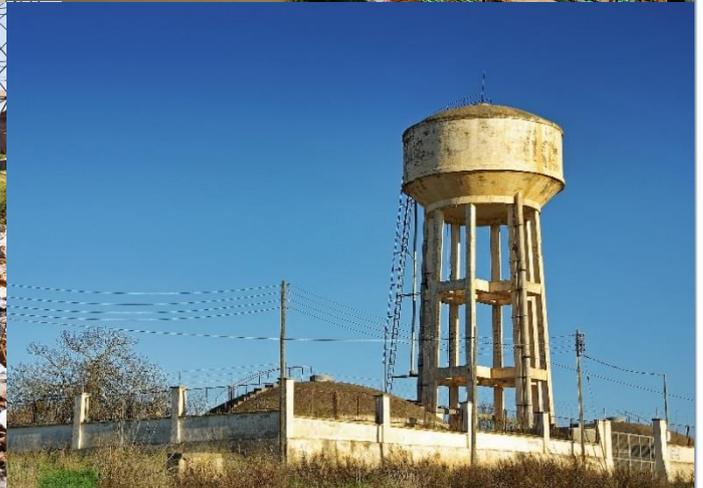




25 years Netherlands Commission for
Environmental Assessment

SÃO TOMÉ AND PRÍNCIPE (D2B16ST01)

Água Grande Coastal Protection Project



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Advice of the Secretariat

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1. Introduction

1.1 The initiative: Água Grande Coastal Protection Project, São Tomé

The Água Grande District, located in the northwestern part of the island of São Tomé, is vulnerable to the consequences of climate change. Sea level rise leads to continuous erosion and flooding in this area, which is relatively densely populated and intensively used. The coast is lined by the road between the international airport and the town of São Tomé. The Água Grande Coastal Protection Project intends to deal with these issues, by constructing coastal protection measures and rehabilitation measures for the road.



Figure 1: The coastal area of Água Grande



Figure 2: Main project location: Ana Chaves Bay

The Government of São Tomé and Príncipe received a grant from the Government of the Netherlands (RVO) for the Project. Part of this grant is used to undertake the necessary preparatory studies to develop the project. The Ministry of Infrastructure, Natural Resources and Environment (MIRNA) is the Executing Agency for this project. The preparatory studies have been undertaken in the Develop to Build (D2B) phase in order to provide sufficient information regarding the scope, preliminary design, costs and potential social and environmental impacts of the project. This information is needed for potential donors and for a potential application for the DRIVE instrument.

As part of the preparatory phase a Preliminary Environmental and Social Impact Assessment (ESIA) has been carried out. In this preliminary ESIA-report (further “pre-ESIA”) several alternative options for the coastal protection and road rehabilitation measures have been described and evaluated, based on a first assessment of potential impacts.

1.2 Request of D2B and involvement of the Commission

The project is benefitting from D2B/DRIVE funding from the Government of the Netherlands. The RVO, who manages the D2B and DRIVE funds, has requested the Netherlands Commission for Environmental Assessment (NCEA) to review the quality of the draft pre-ESIA (final draft, 1 October 2018). Earlier the NCEA has been asked by RVO on two occasions:

- *Screening* the project on (national) ESIA requirements and IFC Performance Standards (September–October 2016)¹ – the NCEA concluded that ESIA would be required, and that several of the IFC PS will probably be triggered.
- *Advice on the Terms of Reference* for the feasibility study, which includes a (preliminary) ESIA (September–November 2016) – the advice on the pre-ESIA and IFC PS has been integrated in the final Terms of Reference (see Annex 2).

This review has been prepared based on a desk review only, and therefore does not constitute an in-depth technical review of the pre-ESIA contents based on a verification 'on the ground' in São Tomé. To remedy this handicap, it was decided to engage external expertise (see the colophon on the first page of this review).

The aim of this review is to check whether the pre-ESIA contains sufficient information to guarantee the full integration of environmental and social considerations in decision-making. The pre-ESIA has been prepared using the ToR for the feasibility study. The NCEA has used the ToR and international best practices (including IFC PS) as a reference framework for this review. If shortcomings are found, the seriousness of this lack of information for decision-making will be assessed and recommendations will be given for supplementary information. If environmental and/or social consequences cannot be determined sufficiently, this could mean a full-fledged ESIA should be prepared.

2. Key findings and recommendations

2.1 Conformity with national ESIA-procedure

The project has been screened according to the São Tomé and Príncipe regulation on ESIA. Decree Law no. 37/99 defines the rules and principles applicable for environmental impact assessment in São Tomé en Príncipe. The decree requires that all activities which by their nature, size or location may result in significant impacts upon the environment should undertake an environmental impact assessment prior to implementation. Annex I of Decree Law no. 37/99 contains a list of activities that may have a significant impact and require an environmental impact study. On request of RVO, in October 2016, the NCEA concluded that an ESIA would be required, because it is likely that one or more of the Annex I categories is triggered.

The ESIA-regulations provide a pre-assessment mechanism whereby the proponent submits a description of the project to the Government authority (in this case the Ministry for the Environment – MIRNA) who then determines the level of assessment required and specific terms of reference to be followed by the proponent in preparing the environmental impact

¹ See Screening PSD/Drive on E(S)IA requirements & IFC PS, NCEA, 10th October 2016

assessment. A screening decision shall be communicated in writing to the proponent within 7 days after receipt of the project description. The terms of reference and the intention to undertake the assessment are published in a newspaper of general circulation in the district of the proposed project. Based on information provided by RVO it seems that a license has been provided by MIRNA, but to the NCEA it is unclear which conditions apply to this license.

2.2 IFC Performance standards

D2B/DRIVE requires that the project meets the standards of the International Finance Corporation (IFC). According to the NCEA, most PS are expected to be triggered by the project.² The NCEA thinks the documents that were provided to the NCEA do not meet all IFC-requirements yet. Vital information, especially on PS 3 (Resource Efficiency and Pollution Prevention) and PS 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) is lacking from the report. See next chapters and annex I.

The NCEA recommends to address the applicability of the IFC Performance standards, especially PS 3 and 6, analyse the consequences of the applicability for the project and see to appropriate measures to deal with relevant conflicts with the standards that may occur. See Annex I for more detailed observations on the IFC PS.

2.3 Quality of technical content and main conclusions

Overall, the pre-ESIA provides a general overview of the safety problems, the proposed technical solutions, the social and environmental impacts and possible mitigation measures. The report concludes that the proposed interventions (the coastal protection works and road rehabilitation) themselves do not require further environmental assessment. According to the NCEA this conclusion cannot be justified sufficiently, because the report lacks information which can be crucial for decision-making. Because of these shortcomings, the NCEA recommends to provide additional information on at least the following issues:

- For implementing the coastal protection and rehabilitation measures a substantial amount of materials is needed, especially rock and sand. The rock will have to be collected from existing or new quarries, sand will have to be dredged from (scarcely available) sand-dredging sites. The impacts of expanding quarries, opening new quarries, sand dredging, transport and (temporary) storage of materials are only briefly mentioned in the report. The report states that these activities may require additional study and safeguards later in the project. However, the environmental and social impacts may be significant for decision-making on the project, because of the scale and severity of the impacts, availability of alternative options (expanding quarries versus new quarries, availability of sand), mitigation measures that will be needed and costs. Furthermore, IFC PS 3 (Resource Efficiency and Pollution Prevention) requires identification of options and measures to avoid, minimize and clean up pollution and to improve resource conservation and energy-efficiency.³ Therefore, according to the NCEA the following additional information should be collected prior to decision-making:
 - the environmental and social impacts of expanding quarries, opening new quarries, sand dredging, transport and (temporary) storage of materials;

² See Screening PSD/Drive on E(S)IA requirements & IFC PS, NCEA, 10th October 2016

³ See Terms of Reference for 'task 8: Preliminary ESIA'

- mitigation measures that will be needed and costs for alternative options (expanding quarries versus new quarries, availability of sand);
- options and measures to avoid, minimize and clean up pollution and improve resource conservation and energy-efficiency.
- The report describes two alternatives for the combination of coastal protection and rehabilitation of the road. Alternative A focusses on robust coastal protection and improvement of the marginal road itself, alternative B focusses on opening up the chance to limit motorized traffic and transform the marginal road into a touristically attractive seafront route, with the prospect of developing a road bypass between the airport and the town. Although the development of the bypass will not be part of the project scope, the decision on alternative A or B will be important for (opportunities for) future touristic developments in the Agua Grande area. Also, a choice for alternative B will have consequences for future costs and impacts (caused by the bypass), which could be relevant for decision-making now. To be able to make an informed choice between the two alternatives, it is important to know what the (long-term) vision on tourism and recreation for this area is. This information is lacking. According to the NCEA the ESIA should contain a long-term vision/objective on tourism and recreation in the Agua Grande area, including the opinions of relevant public, private and civil stakeholders. This means a broader consultation than conducted for the pre-ESIA wherein civil actors were not consulted, and that was limited to the construction works, not about desired future developments.
- The report addresses possible environmental and social impacts, but on a very general level and mostly limited to the project area itself. The report states the project area is not ecologically sensitive and that there are no areas with vulnerable or valuable flora and/or fauna. This cannot be verified from the report. Possible impacts in a larger area are neglected or only mentioned very briefly. For decision-making and more detailed design these impacts could be relevant. According to the NCEA the ESIA should contain information on the direct and indirect impacts on flora and fauna in a larger area, both marine (coral reefs, benthos, fish etcetera) and terrestrial. According to the NCEA, the report does not meet IFC PS 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) sufficiently.
- A comprehensive list of mitigation measures is described, but the priority/importance and feasibility of these measures remain unclear. According to the NCEA, an Environmental Management and Monitoring Plan (including responsibilities, timing and estimation of costs) should be part of any ESIA.

The NCEA recommends to provide the information mentioned above before decision-making on the project, as an addition to the pre-ESIA or, preferably, as a full ESIA.

In chapter 3 the NCEA presents further explanation of the observations and recommendations, following the chapters of the pre-ESIA. The NCEA recommends to take the recommendations into account during further development of the project plan, the environmental and social management and monitoring plan and preparations for construction.

3. Explanation of findings and recommendations

3.1 Project scope and objectives

Chapter 1 describes the scope of the project. Originally, coastal protection was the (main) objective. In 2017/2018 a redefinition of the scope has been agreed on, which now included rehabilitation of the road along the coast, between the airport and Pantufo, the *Marginal Road*.

Chapter 2 describes the 'project setting' and defines the problems that need to be solved. This results in project objectives, that have been specified in chapter 5.1. The objectives focus on both coastal protection (houses/properties, traffic) and tourism along the coast. Additionally, requirements are defined on the use of (local) materials, including rock (basalt) and sand.

On the scope and objectives, the NCEA has the following observations:

1. The proposed measures are intended to protect the coastal area against erosion and flooding, under conditions foreseeable up to the year 2100. For 2100, a sea level rise of 70 cm is predicted, based on an intermediate scenario (IPCC RCP 8.5), which is commonly used. However, it seems strange that, with a sea level rise of 70 cm, wave heights would only rise with 20 cm (stated on page 19).⁴ Also, wave uprush seems more important than wave heights. The uncertainties in the impact of climate change will be relevant in determining the robustness (future-proofness) of the measures.
2. A (long-term) vision and objective for the project area on tourism and recreation is unclear. The pre-ESIA does not specify possible areas for tourism, opportunities and constraints for different types of tourism/recreation, expected numbers of visitors, needs for facilities and infrastructure etcetera. This information is relevant for the choice between alternative A and B for the marginal road.

The NCEA recommends:

- To provide a sensitivity analysis for the impacts of climate change (particularly on sea level, wave heights and wave uprush) and to describe how to deal with uncertainties.
- To provide a long-term vision/objective on (the opportunities for) tourism and recreation (taking public, private and civil stakeholder opinions into account) for the Água Grande area, including the possible consequences for infrastructure and other facilities in the coastal area.

3.2 Baseline conditions and autonomous development (chapter 3)

The description of the present situation in chapter 3 is rather superficial, general and sometimes outdated, particularly on the environmental issues. Most information is taken from general publications and no physical field information has been used. It is obvious that the Agua Grande coastal zone has less ecological value and importance than other (less populated) areas on the island, but this does not mean it has no value at all or has no vulnerable areas. Rather little knowledge exists on the aquatic flora and fauna offshore.

⁴ The NCEA does not have access to the vulnerability report, which is mentioned in the preliminary ESIA-report,

The report states that no living coral reef occur within the project area, but diving organizations mention the existence of several coral reef areas within the Lagarto bay area. Because specific information on current conditions is lacking, it is difficult to evaluate the impacts of the project on flora and fauna. See § 3.5.

The NCEA recommends to provide more detailed information on the current conditions in the project area and a larger area that may be directly or indirectly influenced by the project, including potential quarry- and sand dredging sites, transport routes and storage.

A serious threat for the environmental situation in this coastal area is the absence of sewerage systems, wastewater treatment installations and proper solid waste collection and storage. These threats will not be dealt with by the project, which means pollution will remain a problem in the future situation.

Although it is not in the scope of this project, the NCEA recommends to look into possibilities to tackle these problems at the same time, especially how and where construction works could be combined.

3.3 Institutional context (chapter 4)

Chapter 4 describes the relevant environmental framework, including the decree that is relevant for environmental impact assessment. It is stated that coastal protection works and exploitation of construction materials are not on the list of projects that require 'further environmental assessment', as far as they do not affect environmentally sensitive areas. According the NCEA, this cannot be verified sufficiently from the report, because sensitive areas have not been identified specifically and because the sources of construction materials (rock and sand) is not clear yet.

Chapter 4 also contains a list of IFC performance standards, but the consequences of these standards are not elaborated in the report. See annex 1.

The NCEA recommends:

- either to add the information that is mentioned in Chapter 2 of this review to the pre-ESIA, to justify the conclusion that the project does not need any further environmental assessment;
- or, preferably, to perform a full ESIA for the project, including the information that is lacking. Performing a full ESIA will not only ensure that the project meets with national legislation and IFC performance standards, it will also mean that results of the assessment will be publicly available and can be used to inform and involve public and private stakeholders in the decision-making process.

3.4 Project alternatives

3.4.1 Coastal protection works (chapter 5.4)

Chapter 5.4 shows a large variety of coastal protection measures, of which only two options are selected as realistic and feasible (revetment and coastal wall construction). Most of the

other options are dropped based on financial and/or technical reasons, without providing further justification. Environmental or social issues do not seem to play an important role in this selection.

The NCEA considers the selected preferred options to be a logical choice, based on good practice and experiences elsewhere. However, the environmental and social impacts of the proposed measures have not been analysed sufficiently yet. It cannot be ruled out that impacts turn out to be unacceptable or (because mitigation measures are needed) more expensive than anticipated. If this is the case, other alternative options could prove to be more feasible than expected. The NCEA expects this could be the case for the 'eco-system-based protection measures' which have been considered *unrealistic being technically not-feasible and undesirable in view of touristic interest*. This has not been justified in the report. Only growing vegetation and/or mangrove have been considered as 'eco-system-based protection measures' while one could think of other eco-system-based protection measures like areas where the tides can come in to divert the flooding, while avoiding or mitigating some of the issues that are typically attached to sea walls like coastal erosion and soaring costs. According to the NCEA these measures could prove to be beneficial from a climate adaptation point of view as well as a touristic point of view (depending on the expected types of tourism – see § 3.1). A combination of revetment, coastal wall and eco-system-based measures could prove to be a realistic option.

The NCEA recommends:

- to provide more information on technical and financial constraints of other alternative options, so the pros and cons of all options can be judged more equally;
- to take the option for a combination with eco-system-based measures into consideration

3.4.2 Road rehabilitation works (chapter 5.5)

Chapter 5.5 describes two alternatives for the combination of coastal protection and rehabilitation of the Marginal Road:

- Alternative A focusses on robust coastal protection and improvement of the marginal road itself. The main function of the road will remain as it is, meaning that motorised traffic between the airport and the capital city will use this route.
- Alternative B focusses on limiting motorized traffic by (speed) limitations at some locations and giving priority to pedestrians and cyclists, and possibly closing down parts of the Marginal for motorized traffic. For alternative B the Lagarto road is designed with a slightly reduced carriageway width (total 6 m instead of total 7 m). For this alternative it may become necessary to open up an alternative route to connect EN1 directly to the city centre and the airport. This will be inevitable when parts of the road would be closed for motorised traffic. This means new infrastructure will need to be built and the distance from the airport to the city will increase (from 3,5 to 7 km). At the same time, this option will open up possibilities to transform the marginal road into a touristically attractive seafront route.

A choice between alternative A and B has not been made in the documents. The pre-ESIA states that development of a new bypass road is not part of the project scope and will eventually need a separate (full) ESIA. According to the NCEA the road development should not be separated from the coastal protection measures. Even if the bypass will not be part of

the project scope, the decision on alternative A of B will be important for future touristic developments in the Agua Grande area. Also, a choice for alternative B will have consequences for future costs and impacts (caused by the bypass), which could be relevant for decision-making now.

As stated in § 3.1, it is important to know what the (long-term) vision on tourism and recreation for this area is, including the opinion of relevant public, private and civil stakeholders, obtained from a broader consultation.

Additionally, the NCEA recommends to provide a (rough) assessment of environmental and social impacts of the development of the bypass, so these impacts can be weighed in the decision between alternative A and B.

3.5 Project impacts and impact rating (chapter 6)

According to the ToR, in the pre-ESIA, the key impacts of the (packages) of interventions need to be identified, and these need to be integrated into the comparison and prioritization of alternative options. On the basis of consultation and expert judgement, the pre-ESIA then needs to prioritise impacts that require further exploration in the subsequent ESIA process of phase 2. The NCEA observes the following:

- Some real judgements of environmental impacts are missing, e.g. from the sand dredging site and quarries. The same applies for impact on possible ecological values like the existence of corals within (the vicinity of) the project area or the sand dredging site. Also, it is unclear what the ecological value of the benthic fauna of the south of Lagarto bay is. According to the NCEA, the conclusion that there will not be any significant impact on biodiversity, flora and fauna cannot be drawn yet. Therefore, the NCEA concludes that the report does not meet the IFC PS 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources).
- In Chapter 8, p55, the report mentions 'some associated activities may require additional study and safeguards', i.e. the exploitation of construction material; transport of construction material; everything associated with sand nourishment and dredging; and the eventual construction of a connecting road between EN1 and the international airport. As mentioned before, about these aspects some important questions remain unanswered, like the capacity of the existing dredging site and quarries. If it is necessary to open new ones, it remains unclear what would be the best sites and what would be the environmental and social impacts and possible mitigation measures.

The NCEA recommends to provide a more detailed analysis of the potential environmental and social impacts, especially on flora and fauna, taking both direct and indirect impacts into account and using the information on the current conditions in the larger area that is mentioned in § 3.2.

3.6 Mitigation measures (chapter 7)

In chapter 7, a comprehensive list of mitigation measures is described for both the construction and operational phase of the project. The priority/importance and feasibility of

these measures remain unclear. According to the NCEA and international best practice, an Environmental Management and Monitoring Plan (including responsibilities, timing and estimation of costs) should be part of any ESIA.

The NCEA observes that the list of mitigation measures contains measures that deal with relatively limited potential impacts, while other issues remain unsolved. This is especially the case with the issue of waste management and subsequent water- and soil pollution, which is not considered at all in chapter 7.

From a climate adaptation point of view the works could have a positive impact on infiltration possibilities by the choices to be made in construction/pavement material (with maximum permeability) and design, e.g. by integrating areas for plants and shrubs to the maximum possible, etc.

The NCEA recommends to provide an Environmental Management and Monitoring Plan, including responsibilities, timing and estimation of costs and to take the observations above into consideration.

Considering the limited capacity of the Environmental Department, the NCEA subscribes the recommendation in the pre-ESIA to deploy an independent Engineer, who would supervise the works, monitor progress, impacts and the implementation of mitigation measures.

Annex 1: IFC Performance Standards

PS 1: Assessment and Management of Environmental and Social Risks and Impacts
Triggered. See previous chapters.

PS 2: Labour and Working Conditions

Expected to be triggered. Pre-ESIA should provide an approximation of the workforce that will be mobilized in project implementation, and identification of any issues regarding the treatment, health and safety of workers that need to be further addressed. Also, whether there are any PS2 issues that may occur in relation to the supply of construction material or management of project waste.

The pre-ESIA and feasibility study address these issues. For this phase of the project, this seems sufficient.

PS 3: Resource Efficiency and Pollution Prevention

Expected to be triggered. Pre-ESIA should provide identification of key alternatives and measures that should be looked into to avoid, minimize, and clean up pollution potentially caused by the project, and improve resources conservation and energy efficiency within the project. In particular, those that may be relevant for the construction phase of the project. Identification of any (sectoral) guidelines for managing impacts that may apply. Consider to what degree the project may be able to contribute to reducing current sources of pollution that cause rivers to carry waste, polluted sediments and water to the coastal areas, and the existence of scrap ships in the area.

As stated in the previous chapters, the pre-ESIA primarily focuses on the coastal protection and road rehabilitation measures itself. For implementing the measures a substantial amount of materials is needed, especially rock and sand. The rock will have to be collected from existing or new quarries, sand will have to be dredged from sand-dredging sites. The impacts of expanding quarries, opening new quarries, sand dredging, transport and (temporary) storage of materials are only briefly mentioned in the report. The report is lacking information on alternatives/measures to avoid, minimize, and clean up pollution (potentially) caused by the project, and improve resources conservation and energy efficiency.

PS 4: Community Health, Safety and Security

Expected to be triggered. Pre-ESIA should provide identification of alternatives or measures that should be looked into to minimize impacts on the health and safety of the local community as a result of the project. Particularly safety and health risks and nuisance from construction for different users of the area (inhabitants, workers, tourists).

The pre-ESIA and feasibility study address these issues. For this phase of the project, this seems sufficient.

PS 5: Land Acquisition and Involuntary Resettlement

May be triggered. Pre-ESIA should provide identification of housing and other properties that may be influenced by the project and for which economical or physical resettlement could be needed (or desirable from safety point of view).

The pre-ESIA addresses these issues and concludes that only temporary resettlement (particularly of street vendors and permanent stalls) may be needed. In case alternative B for the road rehabilitation is selected, the potential construction of the bypass road may require more (economic and/or physical) resettlement. Although the construction of a bypass will not be part of the scope of this project, these impacts may be relevant for the decision on the road alternatives (see § 3.4.2).

PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

May be triggered. The pre-ESIA should provide identification of any possible biodiversity-issues, including protected or areas and endangered species, but also other (non-protected) sensitive areas and species that may suffer or benefit from the project. See Decree Law 37/99, Annex I, screening issues category 16. When adverse effects will be significant, mitigation measures should be defined (in this phase not very detailed).

As stated in the previous chapters, the pre-ESIA provides a superficial, general and sometimes limited description of ecological values that may be influenced by the project. Most information is taken from general publications and no physical field information has been used. Rather little knowledge exists on the aquatic flora and fauna offshore. Also, the report doesn't provide information on ecological values of potential (existing or new) quarries and sand-dredging sites. Because specific information on current conditions is lacking, it is difficult to evaluate the impacts of the project on flora and fauna. According to the NCEA, the conclusion that there will not be any significant impact on biodiversity, flora and fauna cannot be drawn yet.

PS 7/PS 8: Indigenous Peoples and Cultural Heritage

Expected not to be triggered. Pre-ESIA should confirm that there are no indigenous peoples and cultural heritage objects within the sphere of influence of the project.

The pre-ESIA states that some of the trees along the coast are considered to be elements of cultural heritage. The project intends to conserve these trees as much as possible. Indigenous peoples are not mentioned in the report.



TERMS OF REFERENCE



Água Grande Coastal Protection Project (D2B16ST01)

TERMS OF REFERENCE

1. INTRODUCTION

The Government of São Tomé and Príncipe received a grant (D2B16ST01) from the Government of the Netherlands for the Água Grande Coastal Protection Project. The Government of São Tomé and Príncipe intends to use part of the grant to contract a consulting company (or a consortium of consulting companies) to undertake the necessary preparatory studies to develop the project. The Ministry of Infrastructure, Natural Resources and Environment (MIRNA) is the Executing Agency for this project.

The preparatory studies will be undertaken in the Develop to Build (D2B) phase in order to provide sufficient information regarding the scope, preliminary design, costs and potential social and environmental impacts of the project. This information is needed for potential donors and for a potential application for the DRIVE instrument.

The ToR at hand cover the preparatory studies for the coastal protection project: the vulnerability analysis, feasibility study and (preliminary) Environmental and Social Impact Analysis (ESIA).

1.1. COUNTRY BACKGROUND

The Democratic Republic of São Tomé and Príncipe, located in the Gulf of Guinea, and crossed by the equator, is a state consisting of two islands and several islets. Its exclusive economic zone covers approximately 170,000 km². However, its land surface only covers 1,001 km² making it one of the smallest states on the planet and the second-smallest state in Africa.

Being of volcanic origin, the archipelago is characterized by a very rugged terrain, with the following highest points: São Tomé Peak (2024m) and Príncipe Peak (948m). The country has a soil with average fertility and enjoys an annual rainfall of up to 7000 mm.

The Climate

The climate is humid tropical with several microclimates due to the diversity of its quite rugged terrain. The geographical position of the country justifies the existence in these two islands of a humid tropical climate with rain for nine months (September-May) and a dry and less hot season of three months ranging from June to August.

Population

World Bank data from 2014 refer to a population of 186,300 inhabitants, with 64,981 inhabitants in the capital; approximately 34% of the total population. The age structure of the population shows that 43.5% is in the range of 0-14 years, 19.8% of 15-24 years, 30.3% of 25-54 years, 3.5% of 55-64 years and 2.9% of 65 onwards. Life expectancy at birth according to the World Bank is 66 years.

Economic aspects

São Tomé and Príncipe is an agricultural country, with an economy based mainly on the export of cocoa which represents 30% of all agricultural production and 86% of its exports. The industrial base



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is weak, generating only 7% of GDP and 6.5% of employment. High energy costs reduce the productivity of the business sector by reducing its liquidity.

A poverty profile study conducted in 2001 indicates that 54% of the population lives below the poverty line and that 15% of the population is in extreme poverty. Poverty remains a predominantly rural phenomenon, with 65% of the rural population living below the poverty line and 25% in extreme poverty.

In the case of São Tomé and Príncipe, Aid for Public Development has been indispensable to the State Budget in recent years, and will continue to be so. External resources represent between 90-95% of the funding of the Public Investment Programme (PIP), which are essential for the implementation of poverty reduction measures (PRNP).

Although the economy remains vulnerable to external and internal shocks, the outlook remains positive. GDP grew in recent years, particularly due to the bonuses embedded with the Petroleum Production Sharing contracts, tourist activities and services which accounted for a growth of 4% between 2010 and 2014. According to IMF projections, GDP growth will oscillate between 5% and 9% from 2015 to 2020. The trend of the annual inflation rate has consistently been downward in recent years, going from 26% in 2008 to 6% in 2015, and a forecast of 4% for 2016. The debt figures have had an upward course and, according to the Breton Woods institutions, currently reach a value of US\$280 million.

1.2 ÁGUA GRANDE DISTRICT BACKGROUND

The coastal area of Água Grande district covers an area of 16.5 km² that ranges from São Tomé airport to the community of Praia Melão. The district includes both the Bay of Ana Chaves and the Praia Lagarto Bay. The figures below show the coastal area of the Água Grande district and the main D2B project location respectively. Whereas the Ana Chaves Bay (up to Pantufo) is the main project area the actual project may also include coastal protection interventions along Largato Bay. The inclusion of the Largato Bay area would depend on the need of coastal protection interventions in that area and the available financial resources. The Ana Chaves Bay is the project's first priority.

In this respect, it should be noted that the World Bank is also planning interventions in the area which may include works related to the road from the airport to São Tomé. World Bank projects with which overlap should be avoided are the Transport Sector Development Project which is currently being designed and the ongoing Adaptation to Climate Change Project, Phase II. In addition, the EU Delegation in Libreville expressed interest in the D2B project as well.



Água Grande Coastal Protection Project (D2B16ST01)



Figure 1: The coastal area of Água Grande



Figure 2: Main project location: Ana Chaves Bay

According to data of the IV General Census of Population and Housing 2012, the population of the district is concentrated around the capital which makes São Tomé a crowded city with a total of 69,454 inhabitants, of which 52% are female, and a population density of 4,209 inhabitants per km². Approximately 40% of the population is under 15 years old.

The Ana Chaves Bay, which constitutes the main project area, is located in the western part of the city of Sao Tomé, bordered at the Northeast by the Bay of Lagarto Beach and Southwest by the Fortress Ponta de Sao Jeronimo. The coastline is, in its entire extent, flat, a little rocky, with a slightly long beach locked in the bay. It is a semi-open shallow bay where one can find the estuary of one of the country's main rivers, Água Grande River, which gives the name to the district where the bay is located, as well as the estuary of various smaller rivers and water lines that flow into it.

Main Economic Activities

The main economic activity of the district is the provision of services. The high density of the population of this district is due mainly to the location of the capital, which is the main political, administrative, social, economic and cultural centre. Most people work in the state public administration and the private sector, particularly in commercial, banking, insurance, small industries and services among others.

The tourism sector is in upswing. Although it has not reached its desired target, this sector has been growing in recent years and has, thus, contributed to the national GDP. The airlines making connections between São Tomé and Europe tripled the number of weekly flights. Hotels are with occupancy of around 80% and every day, more tourist arrivals in the country are registered. São Tomé practices a selective tourism, not a mass one, for both the conception and the development of national tourism policy, the environmental protection is inextricably associated.



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Climate Change challenges in the District of Água Grande

The sea level has been rising gradually throughout the country. Reports from people living in coastal areas according to a survey carried out by a national technical team, on the day of the Second National Communication on Climate Change, drafted in 2011 and submitted to the Secretariat of the United Nations Framework Convention on Climate Change in 2012 underline this fact. Furthermore, on the occasion of conducting research in the field, in the framework of the preparation of the National Plan of Adaptation to Climate Change (NAPA), the population living in coastal areas downrightly presented landmarks on the coast, which visibly show the retreat of the shoreline.

The global forecasts of the Intergovernmental Panel on Climate Change (IPCC) show various types of scenarios for the rising sea levels. These scenarios, documented in IPCC's Special Report on Emissions Scenario (SRES) based on a climate profiling exercise carried out by the University of Oxford, provide the following sea level elevation forecasts for the region of São Tomé and Príncipe:

- 0.16 to 0.53m in SRES A1 (rapid economic growth in a more integrated world);
- 0.18 to 0.56m in SRES A2 (a more divided world of independently operating, self-reliant nations, a continuously increasing population and regionally oriented economic development);
- 0.13 to 0.43m in SRES B1 (a more integrated and ecologically friendly world with material intensity and introduction of clean and resource efficient technologies);
- 0.10 to 0.65m in SRES B2 (a more divided world and ecologically friendly; less rapid and fragmented technological change).

Through the SRES scenarios one can imagine the impact on the flora and fauna and the significant economic losses which would take place in the coastal zone of São Tomé and Príncipe.

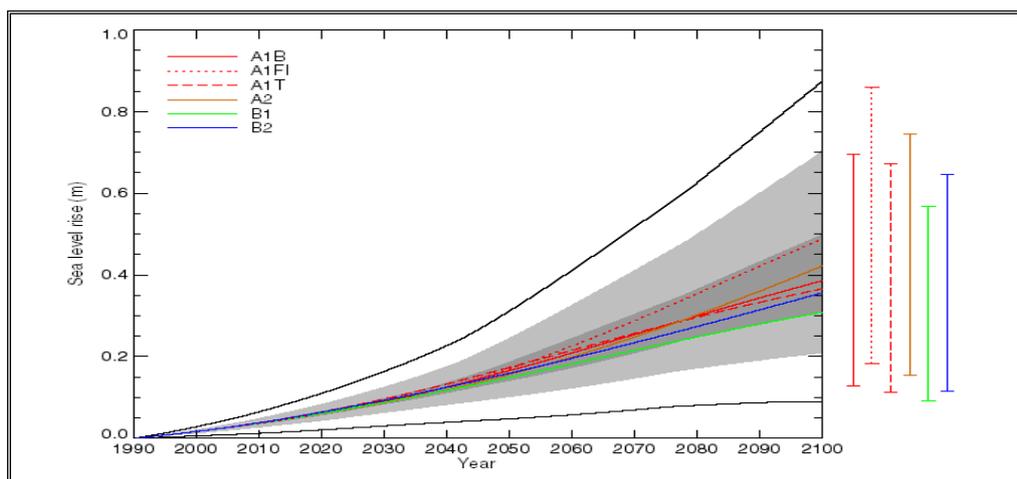


Figure 3: Global Scenario of higher average levels of the sea (1990-2100)

Degradation of the coastal zone

The entire Bay suffers from the consequences of strong sea turbulence mainly caused by the rise of the sea level and extreme marine phenomena related to climate change. The main infrastructure located in the area, including access roads, pavements for pedestrians, small boats of artisanal



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fishermen, protective walls, among others, have been suffering from accelerated and regular degradation.

Degradation of beaches with touristic potential

The bay has been under major coastal erosion and degradation of its bathing area (beaches) as a result of sediment losses also caused by extreme maritime phenomena connected to climate change. Furthermore, the accumulation of sediment coming from the interior of the country throughout the river that flows into the bay is another problem which limits the navigation of vessels and medium-sized ships. Finally, the lack of sewage and rainwater draining systems result in floods in the whole capital and, in particular, along the bay when heavy rains fall.

Current conditions of infrastructure along Ana Chaves Bay

The degradation of the area caused by major coastal erosion endangers all existing infrastructures while also constituting a risk to pedestrians circulating in the marginal. Along the Bay there are important economic and social infrastructures, namely, commerce, schools, insurance, banks, ports, hotels, museum, telecommunications, among others. All these structures are at risk with increasing sea levels.

The main road linking the country's capital to the airport, with more than 50 years of use, is also subject to constant degradation due to coastal erosion, intensive circulation of vehicles, and little maintenance.

Thanks to its natural and scenic beauty, the whole bay has a strong tourism potential, which is currently not exploited due to lack of adequate tourism infrastructure. Another aspect to underscore is the destruction of the sidewalks caused by the roots of large shade trees.

Finally, the rivers flowing into the bay drag residual waste. This waste contributes to the city's poor image; damaging tourism potential. The weak capacity of the authorities to ensure proper management of solid waste, as well as the existence of scrap ships on the coast also contributes to the degradation of the landscape.

Government response to Climate Changes challenges in Água Grande District

In line with the project description outline above, the Government of São Tomé and Príncipe foresees the need to invest in coastal protection infrastructures in order to mitigate the adverse impact of climate change on the country's development. Having these infrastructures in place will also facilitate private sector development in the country's tourism sector. The private sector will be responsible itself to invest in actual tourist infrastructure such as hotels and restaurants.

The possible infrastructures to be set up/rebuilt are:

1. Breakwaters (5 km)
2. Protection walls (6 km)
3. Canoes/marine parks for local fishing industry
4. Strengthened sidewalks (36,000 m²)
5. Widening marginal avenue (6 km)
6. Air pedestrian crossings



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The ultimate objective of these proposed works are to reduce the vulnerability of the country's capital, São Tomé, to the risks linked to extreme marine phenomena of the climate change by strengthening resilience and promoting the reconstruction of the Ana Chaves bay for tourist exploitation and development of the country.

The text below provides a brief explanation on the needs for each of the possible infrastructures listed above. It is possible, however, that over the course of the study other necessary infrastructural works will be identified.

1. Breakwaters (5 Km)

In light of the level of erosion along the coast, with the power of the waves at high tide, the construction of this infrastructure will help retain sediment to prevent coastal erosion, which will reduce their impact.

2. Protection wall (6 Km)

This infrastructure will strengthen the safety of the population and coastal communities and ensure the safe circulation on the national road. This includes the extension of the roadsides and the demolition of old walls defining the sidewalks.

3. Canoes/marine parks for local fishing industry;

This infrastructure will protect the canoes from strong sea turbulence, allowing the reduction of financial losses of the local fishermen. In other districts in the country, within the scope of the World Bank's Adaptation to Climate Change project, this has been realized by means of simple concrete constructions sheltering the canoes.

4. Strengthened sidewalks (36,000 m2);

Various infrastructures in the marginal suffer from coastal erosion due to the rising sea level and have been in constant and accelerated degradation. Not only the existing infrastructures have been affected, but also the sidewalks and roads. Moreover, extreme events related to high rainfall cause infiltrations in degraded sidewalks and especially in the damaged parts. The reestablished sidewalks are part and parcel of the coastal protection works. This intervention is therefore necessary and complementary to the protection of infrastructure to be built in the overall scope of the project. The completed sidewalk structure will also create conditions for private sector tourism investments along the marginal.

5. Widening marginal avenue (6 km)

As with the sidewalks, the enlargement of the marginal is a necessary and complementary action to protect and create a greater longevity of the infrastructure to be built within the project. It will also contribute to the management of the marginal facilitating private interventions to foster the tourism sector.



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6. Air pedestrian crossings (100 m);

Considering the current vehicle flow along the marginal, the main purpose of this infrastructure is to enhance circulation and pedestrian safety, particularly regarding children during the school term.

2. OBJECTIVES OF THE ASSIGNMENT

The main objective of the present study is– based on a quantitative vulnerability analysis - to propose a multi-sector project for Sao Tomé's Água Grande District comprising prioritised interventions, to analyze its feasibility and, thus, to provide the basis for the appraisal of RVO and potential other donors and therewith the decision on whether or not to finance and implement the project.

In order to develop, determine the optimal scope and appraise the infrastructural project a feasibility study needs to be undertaken. Key research questions for the feasibility study are:

- Problem definition: what are the climate risks Água Grande is facing, what scenarios and magnitude of risks are to be expected and which areas and assets are most vulnerable (vulnerability analysis); what is the problem to be solved?
- What are the most appropriate coastal protection or other non-technical measures to solve the defined problems? What is the most optimal scope of the package of measures? What are possible preliminary designs of the measures?
- What are the investments and operation & maintenance costs of the proposed measures?
- What is the economic and financial feasibility of the proposed preferred package of measures (cost-benefit analysis)?
- Financing mechanisms: from what sources will the implementation of the measures be financed and how can the STP authorities subsequently deal with the financing of the operation and maintenance of the infrastructures.

Next to a feasibility study that considers the financial and economic aspects of the project, an environmental and social impact assessment is needed to identify and manage the environmental and social project risks. This ESIA is required both to meet the IFC performance standards and the regulations of the environmental authorities of São Tomé. The preliminary ESIA will be lined up with the pre-assessment that is required according to São Toméan procedures.

3. SCOPE OF SERVICES: OVERVIEW OF TASKS

In general terms the present study shall encompass the tasks summarized below. The task list proposed is non-exhaustive and shall be considered by the bidders as indicative. The bidders are expected to critically analyse and comment the tasks according to their own appreciation of the nature, number and sequencing of the activities and to develop their proposal respectively.

- **Phase 0. Inception**

Upon the start of the contract, the Consultant shall familiarize itself with available documents (see list in Annex A), the situation on the ground and relevant stakeholders in São Tomé. The consultant will update and refine the methodology and work planning elaborated in the proposal. We propose that a kick-off meeting shall be held in São Tomé, introducing the Consultant, his team and the scope



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of the services (vulnerability analysis, the feasibility study and preliminary ESIA) to all relevant stakeholders. Upon completion of the Inception Phase the Consultant is expected to submit a draft “Inception Report”. This report will be presented and discussed with the client and relevant stakeholders.

- **Phase 1A: Identification of climate adaptation risks and solutions (vulnerability analysis)**

By means of a geomorphologic and coastal dynamics study of the study area and climate and socio-economic scenario analysis, the consultant will analyse and assess the risks and problems STP’s Água Grande district is facing (in terms of storm surge, sea level rise, inundation, floods, damages etc.)¹. In addition, the consultant– will identify possible technical and non-technical solutions (measures) relevant for most affected areas in the district. The consultant will also rank the various interventions in terms of priority; clearly indicating for each component what the relevance, effectiveness and urgency is for enhanced coastal protection and private sector development of the district of Água Grande.

Possible infrastructural works to be addressed in the study include but are not limited to:

- Coastal protection works such as:
 - Breakwaters;
 - Protection walls;
 - Canoes / marine parks for local fishing industry;

Consultant can also suggest other solutions or non-technical solutions (land planning/ reservation etc.)

- Rehabilitation of the marginal area such as:
 - Strengthened sidewalks;
 - Widening marginal avenue;
 - Air pedestrian crossings;

Upon completion of the Phase 1A the Consultant shall submit a draft Vulnerability Analysis Report”. This report should be discussed in a workshop with relevant stakeholders. The objective of the workshop shall be to reach a consensus on the prioritisation of the proposed adaptation measures and scope of the overall program of interventions relevant to be studied in the next phase.

This phase should result in an advise for the next phases regarding scope of the program, total costs foreseen and scope and content of the feasibility study and preliminary ESIA.

- **Phase 1B: Feasibility study**

The feasibility study will describe preliminary designs or outlines for the prioritized measures, develop cost estimations and assess the technical, financial and economic feasibility of these measures. The financial sustainability of the program will be investigated based upon potential funding sources to cover the operating and maintenance costs. Moreover, based upon the cost-benefit analysis, potential funding sources from Development Partners (IFI’s, bilateral donors

¹ The consultant is advised to build upon the study for two nearby areas of UNESCO-IHE and Deltares (2011),



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including RVO-DRIVE) will be assessed. The consultant will assess the likelihood that the government of São Tomé and Príncipe can raise the required match funding for the investment costs and funding sources for the operation and maintenance costs. Finally, the consultant will present an advice regarding the procurement strategy for program implementation.

- **Phase 1C: Preliminary Environmental, Social Impact Assessment (ESIA)**

At this stage, the consultant will carry out a preliminary ESIA. The Phase II study will include a full-fledged ESIA according to international standards and local rules and legislation. The consultant will need to make sure that the preliminary ESIA steps are carefully integrated into tasks 1-3 of phase 1A, and task 4 of 1B. The preliminary ESIA is not intended to be a stand-alone set of activities, but serves to integrate environmental and social issues into the problem definition, identification and prioritization of (packages of) measures, stakeholder consultations and costing.

Note that stakeholder identification and consultation is integral to any ESIA process. In a preliminary ESIA it is good practice to consult (a selection of) stakeholders on impacts and identification or alternatives and measures needed, and on how these need to be further developed and evaluated in the next ESIA steps. Consultation can also generate valuable information for the baseline work of the ESIA. See for example: “Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets”. Specifically the sections on: Project Concept & Feasibility Studies and Project Planning. Stakeholder consultation for the preliminary ESIA can be integrated in the consultation steps in the inception-phase (phase 0) and the workshop mentioned in phase 1A.

Aside from integrating the preliminary ESIA into the overall feasibility work, the consultant will also need to ensure that the preliminary ESIA activities are aligned with the São Tomé and Príncipe regulation on EIA (Decree Law no. 37/99). This regulation provides for a pre-assessment mechanism whereby the proponent submits a description of the project to the Government authority (in this case the Ministry for the Environment) who then determines the level of assessment required. The ministry provides specific terms of reference to be followed by the proponent in preparing the EIA. A screening decision shall be communicated in writing to the proponent within 7 days after receipt of the project description. The terms of reference and the intention to undertake the assessment should be published in a newspaper of general circulation in the district of the proposed project.

Finally, the consultant shall recommend whether (and what type of) technical assistance from RVO.nl would be desirable during the tender phase.

4. DETAILED TASKS TO BE PERFORMED

Below the detailed tasks per phase are described.

Phase 0. Inception

Upon the start of the contract the Consultant shall familiarize itself with available documents, the situation on the ground and relevant stakeholders in São Tomé including those in Água Grande district. The list of documents to be consulted is included (the documents are listed in Annex A and available upon request).

The team of key experts shall establish communication links and procedures with the stakeholders and as far as necessary to update and refine the methodology elaborated in the proposal.



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A kick-off meeting shall be held in São Tomé, introducing the Consultant, his team and the scope of the services (vulnerability analysis, feasibility study and preliminary ESIA) to all relevant stakeholders.

Upon completion of the Inception Phase the Consultant is expected to submit a draft “Inception Report”. This report will be presented and discussed with the client and relevant stakeholders. After taking into account the feedback of client and stakeholders Inception Report will be finalized.

Phase 1A: Vulnerability analysis: identification of climate adaptation risks, solutions

Task 1: Analysis of climate variability and its effect on coastal areas

The consultant will be given access to the latest climate data and studies available for São Tomé and Príncipe. The Consultant will develop basic climate (hydro-meteorological) scenarios based on the historic trends and consistent with IPCC scenarios at least until 2050. Building on the scenarios hazard assessments shall be carried out for at least two plausible future climate scenarios:

- moderate climate change (based upon one of the moderate IPCC scenarios)
- extreme climate change (based upon more extreme IPCC scenarios).

In developing the scenarios, it will attempt to determine the future changes of coastal erosion and erosion speed, precipitation, storm intensity, spring tide and storm surge, and sea level rise will be determined for predefined selected coastal areas within the district. Moreover, the scenarios should outline plausible socio-economic developments (population, households and economic activities) and related development of to be affected assets in the relevant vulnerable areas (housing and building stock towards 2050).

These scenarios should provide the basis to (1) delineate areas likely to be impacted by projected climate change effects on coastal erosion but also floods and inundation and storm activities and (2) assess the associated likely impacts on current and future population, assets and critical community infrastructure (see further below).

Data

The consultant will attempt to identify and access any additional public or private data sets, including but not limited to findings of existing shore characterization; base map related information such as DEM, land use (GIS, asset data, satellite maps), population density, land use plans, environmentally sensitive and biodiversity areas; localized records of temperatures, precipitation, wind, currents, tides, wave action, sediment transport, river flows, erosion trends and speeds, and bathymetry, as needed. In the absence of data that are required for modelling and impact assessment purposes for this or any of the following tasks, the Consultant will conduct rapid ground-truthing to fill in those gaps (for example regarding return periods of certain events).

Task 2: Hazard risk mapping and Impact Assessment

Building on the outcomes of the previous tasks, the consultant will assess the hazards and return periods and climate-change-associated socio-economic and environmental impacts (in the do nothing scenarios). Under this task the consultant will take stock of the communities and especially the most vulnerable assets (housing, public, community and enterprise buildings) infrastructure: roads, and to the limited extent that such are available, water supply, health, and/or energy access,



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cultural heritage, and coastal ecology and biodiversity at risk due to climate change consequences, and project climate change impact-associate costs, including:

- Identify and map people, assets, and coastal ecology and biodiversity vulnerable to impacts of climate variability and climate-change-induced consequences.
- Deconstruct the number of people and properties at risk based on people's coping ability and different sectors, including housing and buildings, transport, water supply and sanitation, and, where available, energy and health access.
- Estimate the expected socio-economic damage of climate related events and coastal erosion (in a do nothing scenario): financial damage to assets, permanent lost economic income of activities (tourism, fishing, other) and temporarily economic business interruption damage.

Task 3: Identification and prioritization of adaptation options

Synthesizing the above analysis/findings to assess the nature and level of likely impacts in close consultation with the selected pilot coastal communities, the consultant will consider all existing elements - technical (from the geomorphology and hydrology analyses), social, economic, sustainability and environmental- to identify and recommend the most appropriate coastal protection options. To this end, the consultant will:

- a) Systematize international best practices and potential adaptive interventions for addressing erosion, inundation, and other identified climate change impacts, comparing and prioritizing among soft adaptation options, structural protection measures, and/or retreat.
- b) Assess STP's potential for integrated coastal zone development and management policy approach to help adapt to impacts of climate change.
- c) Review local institutional capacity, commitment, and readiness in preparing for, and responding to, climate-change-related events. This will include an assessment of the availability/capacity of resources which could be used for climate change adaptation measures.
- d) Identify a menu of adaptation intervention options for each scenario, taking into account its natural/physical conditions and institutional capacity, and analyze the cons and pros of each alternative intervention and prioritize in terms of its effectiveness on economic (cost/benefits), social, and environmental grounds. This should include both anticipatory adaptation, exercised prior to expected climate events, and reactive adaptation, which responds to adverse climate events, such as flood/drought, etc. Current maladaptation practices should be clearly identified.
- e) Review and comment the adaption options pre-identified by the Government of STP and assess whether those should become part of the project. The pre-identified adaption options being (see text above for details) (non-exclusive):
 - Breakwaters;
 - Protection walls;
 - Canoes / marine parks for local fishing industry;



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- Strengthened sidewalks;
- Widening marginal avenue;
- Air pedestrian crossings;

Consultant can also consider other technical and non-technical options (land reservation, planning, other) addressing the problems at hand.

- f) Rank the various interventions in terms of priority. Clearly indicating for each component what the relevance, effectiveness and urgency is for enhanced coastal protection and private sector development of the district of Água Grande.
- g) Propose one or two optimal scope programs (alternatives) of potential interventions based upon the prioritization exercise.
- h) Organize a workshop discussing the potential interventions and preferred scope of program alternatives with relevant stakeholders.

This phase should result in an advise for the next phases regarding scope of the program, total costs foreseen and scope and content of the feasibility study.

Phase 1B: Feasibility study

In this phase, the proposed program(s) of interventions from previous phase will be assessed on technical, financial and economic aspects. The feasibility study should have sufficient quality to be acceptable to RVO and other potential funding agencies (IFI's or bilateral donors) and should therefore be consistent with international standards of IFI's such as World Bank or KfW. The following tasks are to be completed:

Task 4: Technical feasibility and cost estimation

The Consultant shall consider and evaluate potential technical alternatives for the prioritized individual measures. Consultant should provide general layout of the measures, including preliminary design and dimensioning. The general layout of measures shall be presented in easy to understand drawings and maps allowing a clear understanding of major technical aspects of the layout. Investment costs (CAPEX) of the measures should be estimated in line with international standards and available national or local data regarding unit prices. The Operation and Maintenance costs (OPEX) need to be estimated for each prioritized intervention.

Task 5: Assess financial and economic feasibility of program and its interventions

Consultant should prepare a financial and economic analysis consistent with international IFI standards for cost-benefit analysis (CBA). The financial (cash-flow) analysis should estimate investment and O&M costs over time and any direct financial revenues related to operating interventions. The economic analysis should estimate the socio-economic costs and benefits of implementing the defined program: inter alia damage reduced (financial, economic, biodiversity) due to implementation of the prioritized measures. Normal results of Financial Analysis and full CBA (IRR's, NPV's and cost-benefit ratios) should be presented. Insights in financial sustainability should be provided also in regard of coverage of O&M costs by national or local authorities. All cash-flow models (financial analysis, CBA in excel or other software) will be handed over to the client as annexes to the feasibility report.



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Task 6: Institutional assessment

The Consultant shall analyse the existing institutional framework (national, regional, local levels), roles/functions and responsibilities as well as capacities and capabilities. The institutional analysis shall provide an understanding of technical, financial, human resource and management capacities and capabilities of the most relevant institutions to ensure appropriate planning, implementation and sustainable operation of the measures. The assessment should be regarded as a quick scan and provide some practical recommendations also regarding Technical Assistance (capacity development) needed.

Task 7: Identify and advise on funding and procurement options

Under this task, the consultant will identify possible funding resources for investment costs and O&M costs. These funding resources should consider all relevant IFI's (including World Bank, KfW, RVO (DRIVE), Green Climate Fund, other) and national and local resources needed for O&M funding and investment costs match funding. Funding options will be assessed in the cash-flow model under Task 5. It should be noted, as mentioned above, that the World Bank and the EU Delegation in Libreville showed interest in the D2B project and indicate the need for coordination. The Consultant is encouraged to explore these opportunities in close collaboration with the local authorities in order to reach synergy and avoid duplication.

In case concessional loans of IFI's would be needed for domestic finance, the consultant will also assess the impact that would have on the country's debt position. Consultant will identify possible procurement-contracting options for works and advise on a sound procurement strategy.

Upon completion of the Phase 1B Consultant shall submit the draft "Feasibility Report" (including Annexes and cash-flow models). This report shall be presented and discussed in a workshop to be held in São Tomé. Based on the results from the workshop, the Consultant will prepare and submit a final version of the "Feasibility Report."

Phase 1C: Environmental, Social Impact Assessment (ESIA)

Task 8: Preliminary ESIA

In this phase of the project, a preliminary ESIA is needed. The preliminary ESIA needs to bring into view what the environmental and social issues are that need to be addressed in project design and implementation.

Focus in this phase is on:

- Integrating social and environmental aspects into the problem analysis and definition of the project objectives under task 3,
- Ensuring that the impacts of interventions are considered when the intervention (packages) are compared and ranked,
- Identification of impact mitigation measures that need to be further addressed in the full-fledged ESIA. Key measures can already be incorporated in the costing of options under task 4 (Phase 1B). In the following ESIA steps the packages of interventions and associated impact measures will be further developed, assessed and consulted on.



IFC Performance Standards

To qualify for RVO financing, projects must conform with the IFC Performance Standards. The ESIA process can be utilized to apply the relevant IFC PSs. Detailed assessment of each PS is appropriate in the full-fledged ESIA that will be part of the second phase. For the preliminary ESIA it is sufficient to consider each of the PS, and draw conclusions on how each PS will need to be further addressed.

- IFC PS 2: Labor and Working Conditions: the full-fledged ESIA will need to contain approximation of the workforce that will be mobilized in project implementation, and identification and management of any issues regarding the treatment, health and safety of workers. In the preliminary ESIA it is important to flag these issues, and also to consider whether there are any PS2 issues that may occur in relation to the supply of construction material or management of project waste.
- IFC PS 3: Resource Efficiency and Pollution Prevention: in the preliminary ESIA key alternatives and measures can be identified that should be looked into to avoid, minimize, and clean up pollution potentially caused by the project, and improve resource conservation and energy efficiency within the project. In particular, those that may be relevant for the construction phase of the project. Identification of any (sectoral) guidelines for managing impacts that may apply is also useful. Identified alternatives and measures will then be further developed in the full-fledged ESIA.
- IFC PS 4: Community Health, Safety and Security: in the preliminary ESIA key alternatives or measures can be identified that should be looked into to minimize impacts on the health and safety of the local community as a result of the project. Particularly safety and health risks and nuisance from construction for different users of the area (inhabitants, workers, tourists). Identified alternatives and measures will then be further developed in the full-fledged ESIA.
- IFC PS 5: Land Acquisition and Involuntary Resettlement: in the preliminary assessment it is important to identify if any economical or physical resettlement could be needed (or desirable from safety point of view). Such resettlement can then be further planned in the full-fledged ESIA.
- IFC PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources: Identification of possible biodiversity-issues, including protected or areas and endangered species, but also other (non-protected) sensitive areas and species that may suffer or benefit from the project. *See Decree Law 37/99, Annex I, screening issues category 16.* When adverse effects are expected to be significant, mitigation measures should be developed in the full-fledged ESIA.
- IFC check in PS 7&8: The ESIA will need to confirm that there are no indigenous peoples and cultural heritage objects within the sphere of influence that could trigger PS7 or 8.



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The consultant will need to deliver a coherent preliminary ESIA report that explains how the preliminary ESIA steps have been integrated into the other feasibility work, and demonstrates how the ESIA work (1C) has influenced and utilized the analyses under 1A and 1B, and vice versa. The report also needs to define the scope of the subsequent full-fledged ESIA process, and draw conclusions on the process to come (i.e. on timing of the ESIA activities, consultation, etc) on the basis of the preliminary ESIA work.

The following needs to be presented in the preliminary ESIA report:

- **Consistency analysis:** The purpose of this step in ESIA is to check the consistency of the project under development with existing (national, regional and sectoral) policies, plans and programmes (PPP). The consequences of these PPPs for the project (for project objectives or for conditions and standards to be met, for example) need to be analysed and described. This is not intended to be an exhaustive analysis at this stage, but it will be important to identify, for example, any protected features in the project influence area, or dust and noise emission standards that construction activities need to conform with.
- **Alternative options:** These will be developed under task 3. As part of the preliminary ESIA it is important to check whether there are any intervention (packages) that should be considered from an environmental or social perspective. This is important input in activity 3d. The preliminary ESIA report should explain how such considerations have been included in task 3 overall.
- **Identification of impacts (including cumulative effects):** in the preliminary ESIA, the key impacts of the (packages) of interventions need to be identified, and these need to be integrated into the comparison and prioritization task 3. As indicated in *task 3F-H*, the alternative options will also be ranked and discussed with stakeholders. The key environmental and social impacts should be included in this ranking exercise. On the basis of consultation and expert judgement, the preliminary ESIA report then needs to prioritize impacts that require further exploration in the subsequent ESIA process of phase 2.
- **Mitigation measures:** The preliminary ESIA should identify measures needed to prevent, reduce and eliminate as fully as possible any significant adverse effects of the project interventions under consideration. (Note that often mitigation options are part of the development of alternatives). In the preliminary ESIA the key measures that require further development need to be identified (see also the IFC PS). The description of the relevant measures does not yet need to be elaborated in great detail, but it is important to know if reasonable measures are available if there are likely to be impacts that are problematic. The report should state which mitigation measures need to be further developed in the subsequent ESIA process and how.
- **Assessment framework:** For further developing and comparing the (packages of) project interventions and associated measures, an assessment framework is needed: which environmental, social and economic effects and criteria are relevant and which indicators can be used to assess the different project intervention packages (and the associated measures) against those criteria. (See Decree Law 37/99 Annex IV, article 6 for a list of effects to consider). It is important to identify 'significant' effects and (measurable) indicators, taking different



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stakeholders in the area into account. In the preliminary ESIA, indicators don't have to be detailed, but the framework should show the intended focus of further ESIA work.

- **Consultation:** An explanation of how stakeholders have been identified and included in the preliminary ESIA, how their input has been utilized and what information has been provided to stakeholders to inform their involvement. The report should state which stakeholders need to be included in any subsequent ESIA activities, and how.

The preliminary ESIA Draft Report will be discussed with the client and presented to stakeholders in a workshop together with the feasibility study.

5. DELIVERABLES, TIMEFRAME AND LOCATION

5.1 DELIVERABLES

The consultant is required to submit the following deliverables (in draft version and final version):

1. **Inception Report:** Approach and Workplan (draft to be submitted one Month after contract signature);
2. **Vulnerability Analysis Report:** including scenarios, vulnerability analysis and proposed interventions;
3. **Feasibility Report:** including annexes with preliminary design drawings, cost estimations and maps and CBA cash-flow excel models.
4. **Preliminary ESIA Report.**

The reports, which shall be made available in English and Portuguese, will have a clear and concise executive summary for each one (of maximum 5 pages) and a maximum of 50 pages per report. Clear structure, comprehensiveness and readability of the reports are major requirements. Detailed analyses, tables, maps and drawings shall be included as annexes.

5.2 TIMEFRAME

The assignment is expected to take 8 months from contract signature. One month after contract signature the Draft Inception Report should be submitted. The Draft Vulnerability Analysis Report should be submitted 3 Months after contract signature. The Draft Feasibility study and ESIA Report should be submitted 7 Months after contract signature. In Month 8 finalization of reports is expected.

5.3 LOCATION FOR SERVICE DELIVERY

The assignment will be conducted mainly at the premises of the consultant. A number of missions are required to São Tomé:

- Inception mission
- Vulnerability analysis mission
- Feasibility study mission
- ESIA mission



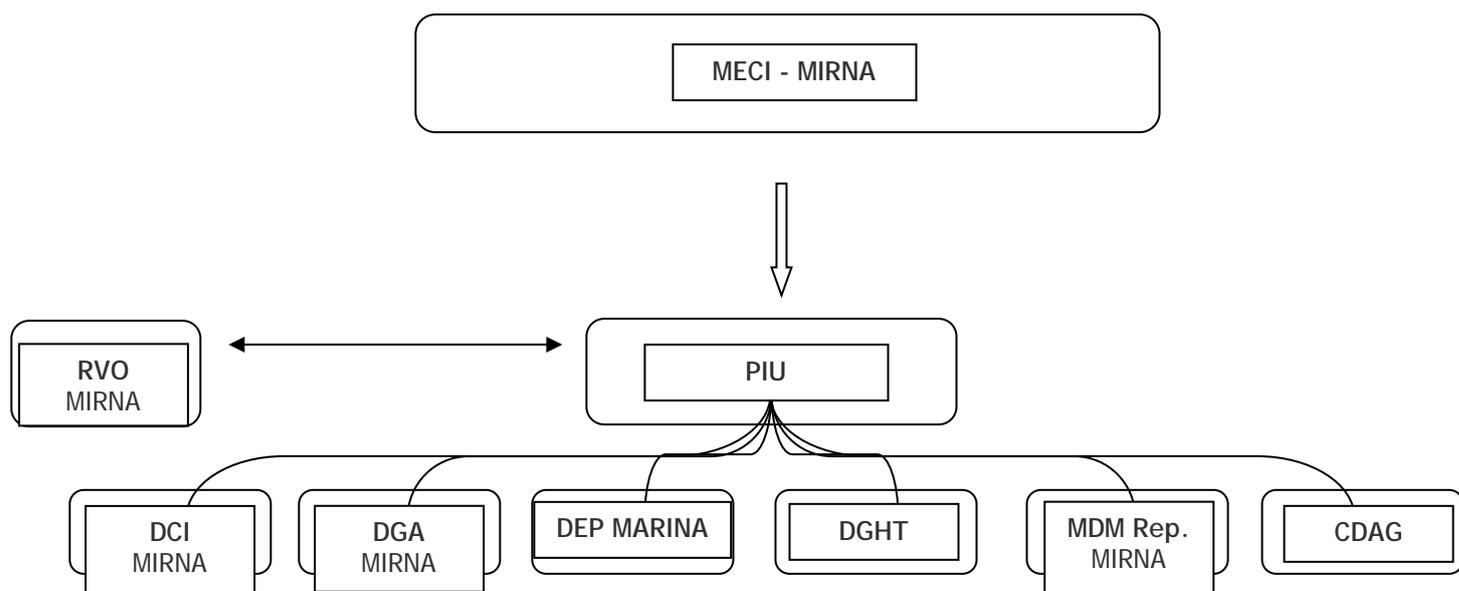
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- Final reporting and workshop mission

Consultant should specify missions to São Tomé and estimate required budget also as part of the incidental expenditures. Office space in São Tomé will be provided by MIRNA for a reasonable number of experts (4-5).

6. MANAGEMENT AND CONTRIBUTION OF LOCAL COUNTERPART

The Formulation Phase and the Development Phase of the foreseen studies and projects will be under the responsibility of a multisector commission, previously mentioned. This commission, already acting, is responsible on behalf of the Ministry of Economics and International Cooperation (MECI) and the Ministry of Infrastructure, Natural Resource and Environment (MIRNA). While MECI is charged with funds seeking, coordination and monitoring, MIRNA acts as technical supervisor. Find below the organization chart.



Legend:

MECI	Ministry of Economic Affairs and International Cooperation
MIRNA	Ministry of Infrastructure, Natural Resources and Environment
MDA	Ministry of Defense and the Sea (Representative)
CDAG	District Chamber of Água Grande (Representative)
RVO	Netherlands Enterprise Agency
PIU	Project Implementation Unit
DCI	Directorate for International Cooperation
DGA	Directorate for Environment
DGHT	Directorate for Hotels and Tourism
DEP	Directorate for Studies and Planning

The Government of São Tomé and Príncipe has created a **Project Implementation Unit (PIU)** which is in charge of organizing the procurement process for the Develop2Build project. Members of the PIU include: the Director of International Cooperation (MECI), the Director of Environment (MIRNA), the Director of Studies and Planning (MIRNA), the Mayor of Água Grande, the Director General of Tourism and Hotels (MECI) and a member of the Ministry of Defence and Sea.



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A steering committee will be established for supervision of the study consisting of staff of PIU and RVO. The direct local counterpart for the Consultant will be the Ministry of Infrastructure, Natural Resources and Environment (MIRNA).

6.1 COMMUNICATION

The consultant is required to consult relevant stakeholders in all phases of the study. Next to this, two workshops should be held in São Tomé where experts of these institutions and RVO should be invited.

The consultant will consult at least the following institutions during the course of his/her work:

- Key Ministry and Program staff
- Officials of other line ministries, national organisations, NGOs, special programmes and projects in S. Tome and Príncipe.
- World Bank and the European Union.
- Community representatives (municipalities, members of interest groups, economic representatives);

7. PERSONNEL

The qualification requirements for the services to be delivered are provided below.

The personnel assignment schedule shall be coherent with the work plan (activity schedule) and with the number of man-months which will be reflected in the cost breakdown of the Financial Proposal.

The team of key personnel shall comprise at least the competences/functions mentioned below. However, the total number of key experts (which will be considered for bid evaluation) shall not exceed five. The bidders shall submit CV's of the key experts in accordance to the required format.

1. Project Director

The lead firm shall assign a Project Director who shall be empowered by the other consortium partners to represent the association of firms during contract negotiations, for contract signature and for any contract administration matter. The Project Director shall be the focal point for any communication between the Consultant and the Client during the performance of the services. The Project Director shall be available at any time during contract execution to respond to any request or query of the Client.

2. Team Leader

The Team Leader is the key senior expert, predominantly responsible for the smooth implementation and effective performance of the overall services, for the coordination and timely performance of all activities and missions by the associated partners of the Consultant (management of interfaces). Moreover, he is responsible for the communication on site with the local counterparts, for the organisation of the workshops, for the elaboration and timely submission of deliverables and for quality control of the services and the reports. Hence, the Team Leader shall



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dispose of corresponding project management experience and of respective credentials. Next to project management, the team leader will be involved as key expert in a number of the tasks requested.

The Team leader should be an international expert (preferably a civil engineer or hydrologist) having at least 10 years of experience in managing feasibility studies in the field of climate adaptation infrastructure/flood management. The Team Leader should have a proven track record in drafting feasibility reports in English. Experience in Africa and Portuguese language skills are regarded as assets.

3. Other experts

The following fields of expertise are expected to be covered by senior and supporting experts in the team. The senior experts are assumed to closely work together with the team leader in a core team. One expert may cover several of these fields. However, a minimum of 2 CVs of key senior experts (next to the Team Leader) is required to be demonstrated in the proposal. These key senior experts should demonstrate at least 10 years of experience in conducting feasibility studies and/or ESIA. The mix of international and national experts is up to the consultant. At least one of the key senior experts should be an international ESIA specialist. The ESIA specialist:

- Leads the preliminary ESIA-process and develops the report along the steps mentioned before;
- Makes sure the IFC performance standards are taken into consideration;
- Safeguards the linkages between the ESIA, stakeholder engagement and other tasks.

The bidders are free to propose additional expertise fields and local and other supporting experts (in a pool of supporting experts). The following expertise areas should be covered in the overall team and presented with short expert profiles in the proposal.

Expertise field	Specific expertise
Coastal Hydrology and Coastal Geomorphology	<ul style="list-style-type: none"> • Hydrology and climate adaptation • Geomorphology • Flood forecasting • Flood mapping • Climate Change
Environmental expertise (environmental engineering)	<ul style="list-style-type: none"> • Experience in managing and conducting ESIA according to international standards • Experience in conducting ESIA in São Tomé according to the national requirements (registered local ESIA expert)
Civil engineering	<ul style="list-style-type: none"> • Experience with feasibility studies for climate adaptation projects • Preliminary design of Water safety/flood management infrastructures • Cost estimation
Financial and Economic	<ul style="list-style-type: none"> • Financial modelling (cash-flow modelling)



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Expertise field	Specific expertise
Feasibility (economist or MBA)	<ul style="list-style-type: none"> • Cost Benefit Analysis • Experience in Economics of Climate Adaptation (ECA) / flood management • Funding of flood management infrastructure
Other expertise fields	<ul style="list-style-type: none"> • Climate change modelling; • Socio-economic scenario development; • Impact assessment; • Financing and funding expertise; • Procurement of works; • Tourism; • Institutional assessment & governance; • Workshop organizing and moderation.

8. BUDGET

The maximum budget for this assignment is 600,000 euro. This is including fees and incidental costs. Consultants will be requested to provide a financial proposal clearly showing number of days and fee rates of the key and supporting experts and incidental expenditures. The financial proposal should be presented in accordance to the format provided in the Invitation to Tender.

9. LIST OF RELEVANT DOCUMENTS

Any of the documents below shall be made available to the shortlisted consultants, upon request.

1: FIRST NATIONAL COMMUNICATION ABOUT CLIMATE CHANGE

Government of São Tomé and Príncipe. (2011). Ministry of Public Works and Natural Resources. First National Communication About Climate Change.

2: SECOND NATIONAL COMMUNICATION ABOUT CLIMATE CHANGE

Government of São Tomé and Príncipe. (2011). Ministry of Public Works and Natural Resources. First National Communication About Climate Change

3: NATIONAL ADAPTATION PROGRAM ACTION ON CLIMATE CHANGE

Government of São Tomé and Príncipe. (2006). National Adaptation Program Action on Climate Change. <http://unfccc.int/resource/docs/napa/stp01.pdf>

4: NATIONAL METEOROLOGICAL NETWORK CONTEXT

Vaz. (2010). Climate change adaptation project. National meteorological network context and Weather forecasts



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5: NATIONAL STRATEGY ON CLIMATE CHANGE

Government of São Tomé and Príncipe. (2010). National Strategy on Climate Change

6: NATIONAL STRATEGY FOR DISASTER RISK MANAGEMENT

Government of São Tomé and Príncipe. (2010). National Strategy For Disaster Risk Management

7: DELTARES STUDY

Deltares. (2011). Coastal Geomorphology and Adaptation Options Study: São Tomé and Príncipe

8: PLAN DE CONTINGENCE INTER-AGENCES

Sao Tomé et Príncipe (2009). Plan De Contingence Inter-Agences Pour L'assistance Humanitaire

9: ENVIRONNEMENT CLIMATIQUE ET OCEANIQUE

IRD. (2003). Sao Tomé et Príncipe. Environnement climatique et océanique.

10: WORLD BANK. PAD. ADAPTATION TO CLIMATE CHANGE PROJECT

World Bank. (2010). Project Appraisal Document. Adaptation to Climate Change Project