German Development Cooperation with SADC

Project Preparation for the SADC Fund for Regional Water Supply and Sanitation Infrastructure, FRWS

Lomahasha / Namaacha

Cross Border Water Supply Project

(Swaziland/Mozambique)

Consultancy Services

For

Environmental Impact Assessment (EIA) and Climate Impact Assessment (CIA) Study.

Terms of Reference

Contents

Abbreviations

AIAS	Administração de Infraestruturas de Abastecimento de Água e Saneamento
CIA	Climate Impact Assessment
DBSA	Development Bank of Southern Africa
DNAAS	Direcção Nacional de Abastecimento de Água e Saneamento
DNGRH	Direcção Nacional de Gestão de Recursos Hídricos
DWA	Department of Water Affairs, Kingdom of Swaziland
EIA	Environmental Impact Assessment
GPS	Global Positioning System
ICIE	Initial Climate Impact Examination
IEE	Initial Environmental Examination
JWC	Joint Water Commission
FRWS	Fund for Regional Water Supply and Sanitation Infrastructure
KfW	German Bank for Development and Reconstruction (Kreditanstalt für Wiederaufbau
masl	Meter above sea level
SADC	South African Development Community
UTT	Umbeluzi Task Team

1 Introduction

The Terms of Reference (TOR) at hand define the required consulting services to carry-out an Environmental Impact Assessment (EIA) and Climate Impact Assessment (CIA) of the proposed actions under the 'Lomahasha / Namaacha Cross Border Water Supply Project (Swaziland/Mozambique), which is being supported by the Transboundary Water Management in SADC (TWM) Programme. The two proposed actions are:

a. Construction of a 29km long Simunye Clear Water Pipeline with booster pump stations in Swaziland, and
b. Construction of a 3.2 million cubic meter capacity Pinde Dam and auxiliary works in Mozambique.

The purpose of the assignment is to review and improve an existing EIA/CIA report on the proposed actions. The review will include re-assessing the environmental baseline, ascertaining potential impacts and proposing mitigation measures and environmental management plan for the implementation of the proposed actions. The findings and recommendations from this assignment will further serve as background information for the two countries concerned to mobilise financial resources for project implementation.

2 Project Background

The governments of the Kingdom of Swaziland and the Republic of Mozambique wish to improve the living conditions of the people of the border towns in Lomahasha (Swaziland) and Namaacha (Mozambique). The two border towns have a challenge of sustainable water resource. The two governments and the border towns have a general willingness to cooperate on water, as evidenced by initial attempts in the past and a suite of cooperating agreements at both bi-national levels of the bureaucracies as well agreements between the water utilities across the border.

In line with this development the Government of the Republic of Mozambique and the Kingdom of Swaziland have established a Joint Water Commission (JWC) for the management of cross border related water affairs and have created the Umbeluzi Task Team (UTT) to steer the project with the participation of the SADC water division and support from the GIZ-TWM.

With this desire to deliver water to the people of Lomahasha and Namaacha, the two governments approached SADC Secretariat and got this project included in the Regional Infrastructure Development Master Plan, in essence asking SADC for assist them with access for funding. The Member States got support from GIZ acting on behalf of the Governments of Australia, Germany and United Kingdom, to undertake a feasibility study. The idea is to then seek for support from the Fund for Regional Water Supply and Sanitation Infrastructure" (FRWS) for the SADC region which has been established by the German Government through KfW and the Southern African Development Community (SADC. The 15 member states of SADC are entitled to apply for funding for water and sanitation projects. The Lomahasha /Namaacha cross border water supply project, henceforth referred to as "the project", is in the pipeline of potential projects to be considered by the new Fund.

In taking the project forward, starting with resource mobilization, it has been desired to review and update the Environmental Impact Assessment (EIA) and the Climate Impact As-

sessment (CIA) that was done as part of the Feasibility assessment for the Project. Hence the purpose of this assignment as detailed in these TOR.

2.1 Objective of the project

The main objective of the project is the improvement of living conditions of the people in Lomahasha / Namaacha project area through making available adequate water supply and access to sanitation in an environmentally sustainable, technically sound and economically feasible way, particularly for the poor.

The expected impacts of the project shall correspond with the selection criteria of the FRWS, whose main purpose is to boost cross border cooperation in integrated water resources management, so that a regional added value can be generated and that the poor are particularly benefiting from the funds interventions.

2.2 Project area

2.2.1 Location

The Project is located in the Lubombo Region, a mountainous border region between Swaziland and Mozambique with an elevation between 540 m and 600 masl. The proposed water supply system is meant to augment supplies to the border towns and the surrounding rural areas of Lomahasha (Swaziland) and Namaacha (Mozambique), two fast-growing towns with population growth rates of 2.9% and 2.4% per annum respectively.

2.2.2 Climate, rainfall and water resources

The Mean Annual Precipitation (MAP) in the Lubombo Region is estimated between 800 and 900 mm. The main rainy season lies between September and March and presents itself often in the form of storms of high intensity, but rainfall also frequently occurs during any month of the year. The pattern of annual precipitation is very irregular, characterised by seasons showing heavy rainfall interspersed with comparatively dry periods. There are no reliable rainfall records in the immediate catchment, but the Automatic Station at Lomahasha Inkhundla, which is adjacent to the project area has records from 1990 – 2004. The recorded rainfall data suggests an average precipitation of 872 mm per year.

The summer season is characterized by high temperatures ranging from 30 and 35 °C for most of six months between September to March. Winter temperatures are slightly cooler falling between 25°C and 30°C. Occasionally the winter temperatures can fall below 25°C. The solar radiation insulation rises during summer months in September-March, peaking in January to 23 MJ/m²/day. High daily evaporative losses well in excess of rainfall are experienced during summer months (October-March) and tapers off during winter. Evaporation daily rates of 7 to 8mm are recorded during summer, but these fall in winter to between 3-4 mm/day.

The type of climate in the project area results in seasonal variations in water resources availability. The main river in the area is the Umbeluzi which is perennial albeit with large variations in flow volumes between the wet and dry seasons. Most other rivers in the project area are ephemeral.

2.2.3 Geology and soils

The area is underlain by the Karroo Supergroup sedimentary rocks to the west and by Lubombo Rhyolites to the east. The Lubombo-Rhyolites are of volcanic origin. The top is often weathered, fractured and fissured to a depth between 100 and 200m. While this results in clayey soils with good agricultural potential the groundwater potential is poor and is estimated at less than 3l/s on average.

2.2.4 Environmental resources

There has been extensive alteration of natural vegetation due to human settlement and roadside maintenance works along the Lomahasha-Manzini MR 3 road. Consequently, invasive plant species with few indigenous large trees cover the area.

The human presence has also negatively affected the wildlife resulting in most of the animal communities moving away to other more suitable habitat elsewhere. Of particular importance is that the proposed pipeline passes through Shewula to Maphiveni which forms part of the Biodiversity Tourism Corridor (BTC) in Swaziland. The BTC falls within the Protection Worthy Areas under the Swaziland Law and is similarly protected in Mozambique.

2.2.5 Population

The project aims to supply the urban and rural population of the project area within a radius of about 5 km around the Border Post between Lomahasha and Namaacha towns. In 2014, the population of Lomahasha was estimated at 6,384 inhabitants for the town itself and 7,441 inhabitants for the rural areas. For Namaacha, the population was estimated at 15,334 inhabitants for the town itself and 2,868 inhabitants for the rural areas.

The project components are designed for the target year 2024 and for a target population of 18,400 inhabitants for Lomahasha and 23,100 inhabitants for Namaacha. In addition, the population of 4 communities along the pipeline from Simunye WTP to Lomahasha (about 5,000 inhabitants) will be supplied, leading to a total target population of around 46,500 inhabitants.

2.3 Proposed actions

A feasibility study was commissioned for the project in 2013. The study produced a prefeasibility report documenting the physical, socio-economic and technical environment in the project area. The same study identified four alternative options for water supply which were further trimmed down to two as presented in these ToR. The subsequent feasibility report defined the two option in greater detail and analysed their economic viability. The two proposed actions have been accepted for further development pending a detailed environmental and climate impact assessment.

2.3.1 The Simunye pipeline

The proposed action considers the water supply network of Lomahasha and Namaacha by connecting it to the existing Water Treatment Plant (WTP) of Simunye in Swaziland.

The Simunye WTP was built in 2010 as part of the Lomahasha & Siteki Water Supply System Project (Phase 1). The project comprises the supply to Siteki and surrounding areas in

the Lubombo region of Swaziland. The installation of this WTP and its operation is executed by the Swaziland Water Services Corporation (SWSC), a government parastatal responsible for the supply of potable water to urban and peri urban areas of Swaziland. This Phase of the Project entails an intake for the water source and the treatment plant that has been constructed at the Umbeluzi River at Simunye. The distribution system is connected to the treatment plant, supported by booster stations and is serving reservoirs for the supply of water to the above-mentioned areas.

The second Phase of this project is the one under consideration and entails, the water supply for Lomahasha and Namaacha for which this assignment has been planned. It is considered to connect the existing Main Pipe (diameter 500 mm) along the main road (MR3). In order to connect the new areas at Lomahasha and Namaacha to the existing water supply system of Simunye, the following activities are proposed:

- Installation of a 29.4 km ductile iron rising main DN 300 mm from Simunye to Namaacha Reservoir (Mozambique).
- Installation of a 540 m ductile iron rising main DN 300 mm to Lomahasha Reservoir (Swaziland).
- Construction of two booster pumping stations along the pumping main.
- Construction of the Namaacha Reservoir (reinforced concrete) with a capacity of 3,200 m³ and construction of the Lomahasha Reservoir (reinforced concrete) with a capacity of 1,600 m³.
- The distribution system of Lomahasha and Namaacha will consist of a pipeline (length approximately 105 km).

2.3.2 The Pinde Dam

This proposed action envisages development of a new water source to connect to the existing treatment works at Cocomela WTWs that currently serve Namaacha in Mozambique.

A dam site has been identified on the Sabasangue River which starts at an elevation of 791 masl. The dam will have a catchment area of 16 sq. km and a capacity of 3.2 million cubic metres. The dam wall is sited at a riverbed level of 445 masl and gives a dam full supply level of 465 masl. The mean annual runoff in the area is estimated at 150mm with a coefficient of variation of 125%. The proposed reservoir has a risk of non-supply of 10%. The environmental flow requirement is reserved at 5l/s.

The dam site is suitable for the construction of either an earth-fill or a mass gravity concrete or rubble masonry dam with the height of water stored estimated at 21 m, which qualifies the dam to be classified as a large dam. Rock for the dam wall construction will be quarried from within the basin of the dam whilst cement and sand will come from the city of Matola, 60km from the dam site.

The proposed action components consist of:

- Construction of the Pinde Dam wall
- Installation of an approximately 3,5 km long, 200 mm dia. HDPE raw water pipeline to transport water from the Pinde dam to the existing Cocomela Water Treatment Plant.
- Construction of a pump station equipped with 38 l/sec capacity raw-water-pumps at the dam offtake.

2.4 Project needs

An initial attempt at developing the EIA and CIA was judged to be inadequate by the project stakeholders and a request for an improved EIA/CIA has been recommended. Consequently a review of the current EIA/CIA study is envisaged under this assignment and it involves additional work to improve the quality of the report produced under the previous assignment. This means the study is not to start from scratch but rather, the consultant is expected to build on the current EIA/CIA report and refine it to meet the standard expected by the environmental authorities in Mozambique and Swaziland.

2.5 Objectives and working concept of these consultancy services

The objectives of these consultancy services are to:

(i) Generate and present sufficient information to enable a decision to be made on the funding of the project through FRWS.

(ii) Identify both adverse and positive environmental and social impacts associated with the proposed actions.

(iii) Develop an Environmental and Social Management & Monitoring Plan (EMMP) for the adverse environmental impacts and a Compensation Plan.

(iv) Develop a climate impact assessment (CIA) and recommend climate proofing, mitigation and adaptation measures for the proposed actions as necessary.

The Consultant shall provide all services necessary for the achievement of the objectives of the requested study and ensure that the EIA/CIA reports are compliant with the governing national laws & regulatory frameworks for the concerned member states of Mozambique and Swaziland.

2.6 Consultancy Tasks

The Consultant is expected to familiarise him/herself with the prevailing situation in the project area, review the initial EIA/CIA assessments and comments thereof, collect required additional basic existing information through interviews and field observations as necessary in order to enable him/her to compile professionally sound EIA/CIA reports for the proposed actions under the project.

2.6.1 Baseline Conditions

1. Review the available literature and project documentation, and submit the **Instruction Process for categorization** of the environmental and social study as stated by Environmental Impact Assessment Decree of Mozambique and the Environmental Impact Assessment Guidelines for Swaziland (Annex 1).

2. Review the current EIA and CIA reports and identify the critical data and analysis gaps that need to be filled to bring the reports to the standard required for approval by the environmental authorities in Mozambique and Swaziland

3. Visit the project area to familiarise with the project sites and surrounding areas and, based on the review in (2) above, consult key stakeholders and line ministries to es-

tablish the baseline conditions in terms of physical and biological environment and socio-economic conditions in the project area necessary to improve the EIA/CIA reports.

4. Prepare maps of suitable scale to highlight the socio-environment resources of the project area.

5. Identify the populations affected by the project with anticipated impacts on them and include an income/asset survey building on the available Socio-Economic Survey report from the project.

6. Identify the application of social safeguards necessary to mitigate against the project consequences.

7. Review the medium to long term climate conditions in the project area and identify climate proofing, mitigation and adaptation as necessary.

2.6.2 Stakeholder Consultations

Following guidelines for Public Consultation recommended by the Mozambican Environmental Authority (in according to the Diploma N^{o} 130/2006, July 2006) and the Swaziland Environmental Authority (Annex 7) implement the following processes to help plug the gaps identified in (2) above;

8. Hold key informant interviews with key project stakeholders:

    a. To screen potential adverse environmental and social issues.

    b. To obtain feedback on the expected social issues related to the project impact and suggested mitigation measures.

9. Document the discussions and prepare the list of participants at such meetings.

The stakeholders should include a mix of the primary stakeholder (those directly affected by the intervention) and secondary stakeholders (those indirectly affected and those who have an interest in the project).

2.6.3 Identification of Environmental/Social Impacts

10. Review the identified, and identify any new, potential environmental and social issues directly relating to the proposed project actions in terms of their nature, magnitude, extent and location, and timing and duration. Specifically, investigate the issues relating to:

    a. Land uses: along pipeline routes, around pump stations, at dam site including loss of agricultural land, natural habitat and the interface with existing flora and fauna.

    b. Soils: including erosion, contamination, landslides and other forms of mass movement, and profile changes.

c. Biodiversity: including the inventory of existing flora and fauna, along servitudes and inundated areas, site locations, protected areas as well as migration patterns.

d. Hydrology: including pollution effects, low flow regimes, drought and flooding risks; ecological flow requirements and groundwater recharge.

e. Air quality and aesthetics: visual impacts, terrain alterations, air and noise pollution.

f. Health and safety: impacts of borrow pits, stockpiling, dust, emissions, fuel spillages and disease proliferation. Impacts of cement and sand transportation from Matola City to dam site;

g. Social disruptions: labour issues, local economy effects, social interaction/disruption. Obstruction of accesses and degradation of sacred sites of communities;

11. Assess and present the potential impacts in relation to the project design stage, construction stage and the project operation and decommissioning stage.

12. Based on impact prediction methods and stakeholder input, screen adverse environmental impacts for inclusion in mitigation measures and environmental management plan.

13. Review the identified, and identify any new, social impacts and other socio-economic impacts relating to the full project cycle incorporating feedback from stakeholder viewpoints.

14. Based on social impact and its respective mitigation prepare the Compensation Plan;

15. Assess existing, and propose additional, appropriate mitigation measures for the identified adverse environmental impacts. These measures could base on exploring the ways to achieve the project objectives by environmentally sustainable ways, proposing changes in the project design (if need be), through improved monitoring, and management practices (storage of construction materials, labour camps, waste disposal, disposal of construction debris, etc.).

16. Suggest social mitigation measures for the proposed project developments including awareness raising, training, social engineering and/or through monetary compensation (including resettlement).

2.6.4 Environmental and Social Management & Monitoring Plan (EMMP)

17. Formulate and describe a comprehensive environmental and social management and monitoring plan to ensure the adequacy and effectiveness of the proposed management by clearly identifying the roles and responsibilities of the contractor, supervisory consultant and the client.

18. Elaborate on the monitoring mechanism and the reporting frequency for the ESMMP.

19. Estimate the cost for the proposed EMMP for its inclusion in the project cost.

20. Similarly estimate the costs of the Social component / social mitigation and compensation measures as a part of the project costs / benefits.

21. Suggest environment and social performance indicators to monitor, audit, evaluate and supervise negative and positive project environmental impacts.

22. Suggest monitoring, auditing and evaluation tools and formats of a monitoring plan including frequency and methodology of monitoring as well as allocate institutional responsibility and costs.

23. Prepare a guidance note to assist the client in obtaining the requisite approvals from the environmental authorities in Mozambique and Swaziland.

24. Be available to assist the client revise the EIA/CIA documents as per the comments received from the environmental authorities in the two counties till final approval.

2.7 Methodology & timeline

The methodology should include a desk study and a mix of qualitative and quantitative data analysis methods. The main objective of the desk study is to review the current EIA/CIA documentation and refine it in line with national guidelines and World Bank standards for impact assessment.

A visit to the project areas is required to get first-hand information about the area. During the field visit key informant interviews should be carried out with local government staff, government staff at the district levels and selected individuals directly affected by the proposed actions and/or those with a vested interest in the project such as the local business community.

The Consultant is expected to submit an inception report, based on the suggestions brought forward in these TOR as well as a preliminary analysis of the provided documentation. The inception report should include timeframes, methodologies for data analysis (and collection if required) and draft interview guidelines and questionnaires.

The consultant will carry out the EIA/CIA studies and prepare final reports over a six (6) weeks period starting from the day of contract signature. A total of 50 man-days are considered sufficient for this assignment.

2.8 Skills required

An EIA Expert team with proven experience in EIAs particularly in the water supply and sanitation sector is required. The EIA Expert team will assume the full responsibility for the overall preparation, coordination and management of the study, as well as the submission of the final deliverables. The team should collectively meet the following qualifications and experience:

- At least a Master's degree in Environmental Engineering, Water Resources Management, Civil Engineering, or similar discipline.
- More than 10 years of experience in environmental impact assessments and/or a related technical field.
- Strong analytical skills and experience in both qualitative and quantitative data collection and analysis.
- Experience with data analysis software packages such as SPSS and Excel,

- Experience with water and sanitation construction projects.
- Experience in working in the context of multi-sector and multi-level cooperation projects.
- Preferably good knowledge of environmental legislation and institutional set up in Mozambique and Swaziland in particular and SADC in general.
- Be able to communicate and prepare good reports in English.
- The ability to communicate in Portuguese is an added advantage.
- Be registered at Mozambican Environmental Authorities (MITADER) for elaboration of environmental impact assessments studies in Mozambique and similarly comply with the legal requirements for Swaziland.
- Experience with cross border collaboration, especially participation in teams consisting of experts from either side of a common border, will be an added advantage.

2.9 Deliverables

The consultant is expected to deliver the following *(For language requirements please refer to Section 3.3 of these ToR)*:

1. Inception Report within TWO weeks of effective date of contract.
2. Draft EIA/CIA Reports (separate for each proposed action) within FIVE weeks of effective date of contract.
3. Final EIA/CIA Report (after incorporating the comments by the Client and MS) within NINE weeks of effective date of contract.

The final reports, one each for Pinde Dam and Simunye Pipeline, are not to exceed **200 pages** each excluding annexes.

In addition the Consultant should be prepared to make presentations on each of the proposed deliverables to a Project Steering Committee (PSC) to be constituted by the member state representatives, SADC and GIZ. The stakeholder costs for such presentations are not to be included in the response to these ToRs.

2.10 Suggested Structure of the EIA and CIA Report

Beside the contents required by the Mozambican General Directive for Elaboration of Environmental Studies Reports (Diploma Ministerial N^{o}129/2006, de 19 de Julho), and similar provisions for Swaziland, the following outline shall guide the preparation of the final project documents. *(For language requirements please refer to Section 3.3 of these ToR).*

2.10.1 Main report

- Cover page
- Acknowledgements
- Executive summary
- Table of contents
- Introduction / Background
- Terms of Reference.
- Methodology or Approach to the study

- Assumption and limitations
- Administrative, legal and policy issues
- International protocols and obligations
- Water supply infrastructure planning
- Description of proposed actions
- Description of the affected environment
- The impact assessment
- Mitigation measures
- Information gaps
- Environmental Management Plan
- Environmental Auditing plans
- Environmental mitigation, management and auditing budgets.
- Conclusions and recommendations
- References

2.10.2 Appendices

- List of EIA Team members
- List of participants (stakeholders)
- Personal communications/minutes of meetings
- Other information

3 Organisation of the study

3.1 Logistics

The bidder for the consultancy services is invited to give details on the envisaged logistical set-up for the execution of the services in his/her technical offer. Office space provided by the project partners is not available in the project area. The consultant has to organise all required logistical support including transport on his own.

3.2 Contribution of MS partners

The Mozambican and Swazi partners will provide free of charge all existing information, data, reports and maps as far as available in their custody and will assist the consultant in obtaining other relevant information and materials from the competent institutions and authorities as far as possible. However, it is the duty of the consultant to check availability, quality and suitability of this information. The information, data, reports etc. as mentioned above will be available for the consultant's unlimited use during execution of the proposed services. All these documents used by the consultant must be returned to the project partners upon completion of the assignment. Due provision shall be made in the proposal in case he has to procure maps, aerial photographs, meteorological, hydrological and geological data, etc. necessary to carry out the services at his own cost.

In general the Swazi and Mozambican partners will facilitate all staff permits, authorisations and licenses required for performance of the consultant's services in Swaziland and Mozambique. The Mozambican and Swazi project partners will also assist the consultant in their field travels and border crossings for the purpose of the execution of the study.

3.3 Reporting

All draft reports shall be submitted to the GIZ-TWM in English. ***Only the finally approved reports shall be translated into Portuguese.*** Reporting shall be performed in accordance with the consultant's schedule and comprise at least the following reports (in Hard and Soft copy):

1. Inception Report (2 copies to Swazi partners [English], 2 copies to Mozambican partners [Portuguese], 2 copies to SADC, 2 copies to GIZ [English])

In the Inception Report the consultant shall present a description of revised/adapted methodology and revised work plan, if necessary.

2. Draft Report (2 copies to Swazi partners [English], 2 copies to Mozambican partners [Portuguese], 2 copies to SADC, 2 copies to GIZ [English]).

3. Final Study Report (4 copies to Swazi partners [English], 4 copies to Mozambican partners [Portuguese], 2 copies to SADC, 2 copies and 2 copies to GIZ [English]).

All documents and reports to be prepared by the consultant during project implementation have to be submitted to the Swazi and Mozambican project coordinators, SADC Water Division and GIZ for commenting. In all documents and reports the consultant has to list the references for the data presented and used.

3.4 Backstopping and quality control

The GIZ-TWM will provide all documentation developed under the project to date and will be the contact for the entire project period. Direct communication with country coordinators is encouraged for specific national issues pertaining to the project.

3.5 For more information

For further questions, please contact:

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